

User Experience Design: *Prototype Application Design – FACE Companion App*

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I. INTRODUCTION

Roto, Rantavuo and Väänänen-Vainio-Mattila [1] suggest that a high degree of user experience (UX henceforth) satisfaction “*comes from the value and meaning of the product concept itself*” [1], a deeper-rooted notion than UI that concentrates on a “*means of interact[ion]*” [1]. Despite this clear separation they are inexplicitly linked, an idea that can be clearly seen in the case of the existing UWTSD website, an evaluation of which will help design a campus application for students of the FACE faculty that provides a quality user experience by fulfilling the diverse motivations of Computing, Engineering and Architecture students of various ages and technical proficiency within the SA1 Campus.

II. REQUIREMENTS GATHERING AND USER RESEARCH

The process of re-designing a system used by such a diverse audience presents several key challenges, ideologies that traditional, developer-centric methodologies can struggle to provide. As such a paradigm, the User-Centred Design [2] (UCD hereafter) is of genuine value given its nature of “*structure[ing] the development process around users and their practises*” [2]. It is suggested by Tidwell [3] that “*users and clients typically speak to you in terms of desired features and solutions, not of needs and problems*” that they currently experiencing. However, this statement for this scenario could be considered slightly misleading thanks to the specialised nature of one target user group. By developing an application for FACE students, within which Computing students make up a noteworthy percentage, several individuals have expressed their requirements not as idyllic features, but as precise solutions to niche problems that they are currently experiencing, as highlighted in *section II. A*.

There are various requirement gathering approaches used to help tease out the feature’s user groups want in a new digital product or service. In some design scenario’s, such as the development of entirely new systems, the use of extreme characters can be used [4]. This concept of developing grossly over-exaggerated user personas adds extra burden on the design and development team(s), a dynamic that works in the designers favour inasmuch as

software solutions produced, albeit unlikely to fulfil the needs of an “*exaggerated personality*” [4] that is unlikely to ever use the platform, is more likely to fulfil the needs of the far more representative user groups. The idea of defining highly precise user personas provides added complications on the developer, aimed at helping to improve the decisions made in the design of an application for all user groups [4] as a designer is trying to develop a single interaction and reduce the likelihood of user mistakes occurring on their path to goal realisation.

A. Focus Groups & Brainstorming

The exercise of brainstorming is of value given its capacity to generate new ideas, especially when this group activity includes potential users from a range of different backgrounds, such as course, faculty or level of study as throwing ideas into a central ‘melting pot’ can bring up functionality, or even specific design elements [5]. This is particularly powerful as “*the most creative or effective ideas often result from combining seemingly unrelated ideas*” [5], formulating unusual or original suggestions. Caution here is advised however as a brainstorming process should also highlight features that are not of primary interest to those in a particular group.

This process, taking the form of an informal discussion driven by the question and response sheet, has been handed to individuals as a requirement gathering sheet, and undertaken as a group with several participants concurrently. The sheet constructed for this purpose is shown below in **Table 1**. Having noticed and highlighted several errors regarding question precision and quantity of feedback items this was later revised, the format of which is illustrated below in **Table 2**.

Table 1: Initial Requirements Gathering Sheet

Student University Companion App – Requirements Brainstorm Sheet Name: • <i>Courses:</i> • <i>Ages:</i> • <i>Years of study:</i> 1. Understanding current software usage <i>1.1. What software do you currently use for your studies?</i>

1.2. Why do you use it?

2. Assessing the suitability of the existing University website

2.1. If you use the current website, what do you use it for?

2.2. What do you like about the current website?

2.3. Why do you like the(se) feature(s)?

2.4. What do you dislike about the current website?

2.5. Why do you dislike the(se) feature(s)?

3. Gauging the potential features of a Campus Companion App

3.1 What features would you like to see in a concentrated companion app?

3.2 Why do you want to see the(se) feature(s)?

3.3 What is the one most important feature from the list you have identified?

3.4 When using such an app, what features would you not want to see?

3.5 Why do you want to see the(se) feature(s)?

4 Is there anything outside of these questions that you would like to raise?

Table 2: Revised Requirements Gathering Sheet

Student University Companion App – Requirements Brainstorm Sheet

Name(s):

- *Course(s):*
- *Age(s):*
- *Year(s) of study:*

Time:

1. Understanding current software usage

1.1. What software and/or sites do you currently use for your studies? Please list all that apply

1.2. Why do you use it/these programs and/or sites?

2. Assessing the suitability of the existing University Website

2.1. If you do use the current website, what for?

2.2. What do you like about the current website?

2.3. Why do you like the feature(s) you have listed?

2.4. What do you dislike about the current website?

2.5. *Why do you dislike the feature(s) you have listed?*

3. Gauging the potential need and contents of a Campus Companion App

3.1. *Is the idea of a companion app something that you would be interested in?*

3.2. *What features would you like to see in a concentrated companion app?*

3.3. *Why would you want to see these feature(s) in the app?*

3.4. *What is the one most important feature for you from this list of features?*

3.5. *When using such an app, what features would you not want to see?*

3.6. *Why might you not want to see these feature(s) in an app?*

4. Is there anything outside of these questions that you would like to add or comments you might make on the proposed system?

Having collected the thoughts and opinions of several FACE students some key trends can be highlighted that must be considered in the development of initial wireframe designs. These are discussed below in the same order as raised on the survey forms displayed in **Table 1** and **Table 2**.

1. Understanding Current Software Usage

Several respondents that completed the first requirements elicitation survey highlighted specialist software for their course that they currently use, such as “Visual Studio Enterprise and “Proteus”, whilst those that filled out the revised form generally noted more generic, wider software related to their University life such as the Microsoft package and Mendeley referencing software. From this it can be deduced that the ability to access core software, be it for download or license keys, and more niche course related packages need to be available in an application aimed at providing students with their software tools for study. This slight variation was only seen in several respondents, such as *Jon, Nick* and *David* who listed just core module software that was considered by one current student “*compulsory for the course*” [male, 29].

2. Assessing the Existing University Website

This question was included so that an understanding could be gained on existing issues with the university website and help identify elements that should be improved in a streamlined campus application. By asking an individual what they like and dislike in the current website, and importantly why, the designers can pay close attention to ensuring they are central to a new application. Several of the survey group highlighted the “Quick Links” page as something that they liked about the existing site because it they felt that it helped them “*navigate to the relevant pages faster*” [male, 26]. Alongside broad design elements there were precise user problems such as the fact it “*doesn’t keep you logged in*” [male, 26] and with the same individual believing that this made the logging in process “*cumbersome*”. Interestingly however that was the only real criticism received by this person about the university site, suggesting that overall it “*combines into a good user experience*”.

Others highlighted far more obvious issues such as the number of pages and complexity of the site, so much so by one student he had no complaints about the system because he does not use it enough to properly comment – instead bookmarking every core page he regularly uses with the exception of particular formal University procedure forms. Another raised the point that some navigation was broken or incorrectly linked, simply refreshing the existing page. Others had issues with colour and design continuity, an element of relative importance in developing a useful and credible app for students.

3. Potential of a Campus App

The general response to the question, “Would you be interested in a companion app” was positive with most students stating that they liked the idea, and most, when asked about some primary features listed platforms and sites that are central to a student’s day at University such as Email, Moodle and the library. Particular reference was made to the access of software and academic journal resources by several students, with one individual stressing the need for ‘search’ functionality for the library resources. The responses here clearly show how the study participants value tools that are integral to daily study. Of interest two people raised the issue of adverts. Given the nature of university software this would not be likely but illustrates how students in some cases could have applied their own experiences of other applications to this scenario.

Overall the need for a streamlined and uncluttered program was shared by most correspondents who said the app should be clear, easy to navigate and only show the most relevant information; two fundamental objectives of the proposed system if it is to be considered useful and valuable.

4. Any Other Comments?

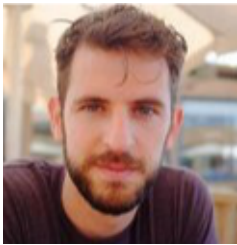
All individuals participating in the survey were asked if there is anything outside the scope of previous questions that they might wish to add, the answer provided by one student will act as somewhat of a summary for this requirement gathering process.

The full paper-based requirements gathering sheets from all respondents can be seen below in section VIII. B) i. and ii.

B. Developing User Personas

By accurately understanding how a user aims to use a system a developer can more clearly evaluate the suitability of mock-up screen designs [6],[7] with Microsoft believing that using user personas have helped to “*make our assumptions about the target audience more explicit*” [8]. In this scenario it is anticipated that the campus companion application will be used primarily by FACE students that study in the Swansea SA1 campus but, given the diverse nature of ‘students’ and individuals studying an array of courses across various sites such an application should be designed in such a way that it is open to extendibility. For the purpose of this application the target user groups all study a FACE course, but the same format of user persona could be developed for a student studying at another campus in Swansea, or in Carmarthen or Lampeter.

Table 3: **Persona A** [9]

<i>Describe the User</i>	
Personal Details 	Name: Ollie Bryant Age: 27 Gender: M Highest Educational level achieved to date: A-Level Subject Studied: BSc Games Development Year of Study: 2 nd (2 of 3)
Professional Record	Since leaving college, Ollie has been on several placements with local Games and Software development firms in Swansea thanks to help from friends that work in the industry. Following these brief spells, he has been in full time work away whilst pursuing this interest in

	his spare time.
Technical Skills and Preferences	Ollie primarily uses his Laptop to run applications such as Unity and Microsoft Word and uses it for lengthy periods during the day in lectures and the library. Moodle is central to his day-to-day routine and keeps track of module content on this device, be it in or outside of his campus. He relies on an Android smartphone to keep in contact with friends via a messaging platform, as well as to keep a check on emails from lecturers and his peers. Likewise, this is used regularly at home and in campus and much of the time outside of conventional working hours because of the busy nature of his study schedule. Due to their course and experience Ollie should be considered a highly competent user of such technology.
<i>User Motivations</i>	
Goals	• Wishes to view student email easily and quickly on the go • Ollie does not like the main Moodle phone app, so would appreciate being able to quickly view a module on the go in seconds.
Discomforts and Irritations	• Ollie relies heavily on academic resources for his work, so would like to be able to easily browse the catalogue on the go, rather than having to go through a long library search on the library computers. • Not being able to easily find subject-specific journal databases quickly as this requires signing-in several times from the main university website.

Table 4: **Persona B** [9]

<i>Describe the User</i>	
Personal Details	Name: Ella

	Age: 20 Gender: F Highest Educational level achieved to date: BTEC Level 3 Extended Diploma Subject Studied: BSc Architectural Technology Year of Study: 1st (1 of 3)
Professional Record	Ella graduated from college last year and has been in part-time work over the summer back home in Bristol. She decided to come straight to University and lives in Student accommodation. During term time she does some part-time work in town and so is always busy with her job or study. Ella tends not to study in university, preferring to work from home when she is not in her job. This means she comes into University for lectures only, rarely visiting the library, the café and the open-access computers across the SA1 campus.
Technical Skills and Preferences	Relies heavily on mobile devices because she does not have a laptop. She works mainly from home when in lectures so has a desktop machine, this is an Apple iMac machine. As she has no laptop, she uses her phone a lot during her time spent on campus, this is an iOS model. Common activities include checking email, lecture information, module content and everything that other students might expect to do on a laptop. If she does need a computer, she typically borrows one from the laptop rack in the IQ building. She is not that technically savvy.
<i>User Motivations</i>	
Goals	• View everything on her phone when she needs to • Print using the printing facilities in the library when she needs to, but this is not a regular goal
Discomforts and Irritations	• Not being able to view timetable changes and lecture information – she is busy and needs to quickly see changes to the schedule as and when they arise. • Not being able to view and top up printer credit when the machines are not

	working. Printing processes and the need to log on to a computer to send a document to the printers is an unnecessarily protracted process.
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Table 5: **Persona C** [9]

<i>Describe the User</i>	
Personal Details 	Name: Matthew Age: 40 Gender: M Highest Educational level achieved to date: GCSEs (O-levels) Subject Studied: BSc Electronics Year of Study: 3rd (3 of 3)
Professional Record	John is a mature student and did not go to college or further education after leaving school, instead going straight into employment. He has worked in several role, none of which related directly to his course, a choice he made having decided he wanted a career change. John applied to University for the electronics course and is now in his final year and is having to balance work and family life – but is not working part time during his study, instead being supported by academic funding from the University. He accepts that at the moment family life has suffered because of this level of commitment. John is a deeply committed student and spends the vast majority of the week in University studying. He works on campus on weekends and is in Uni between 8:30 and 7:30pm most days so interacts a lot with many university applications such as Moodle, Email, and Turnitin to hand in work.
Technical Skills and Preferences	Relies heavily on a laptop during his working day. He has a relatively old android phone, but rarely uses this in University. He does not have a

	desktop machine.
<i>User Motivations</i>	
Goals	• Quickly and easily access core platforms related to study, this is primarily Moodle as it contains material for his final year modules • As a final year student, he is regularly in contact with lecturers during work and non-working hours. Email for his of considerable concern. • Needs specialist software from the universities account with Microsoft.
Discomforts and Irritations	• Moodle maintenance is frustrating as the service is down and inaccessible. The in-availability of Turnitin is equally frustrating, especially during peak times. • Dislikes the current university website because finding the necessary information here believes is very awkward.

Table 6: **Persona D** [9]

<i>Describe the User</i>	
Personal Details 	Name: James Age: 22 Gender: M Highest Educational level achieved to date: A-Level Subject Studied: HND Automotive Engineering Year of Study: 2 nd (2 of 2)
Professional Record	James is in his second year of study on an HND Automotive Engineering course in Swansea. He studied this subject at A-Level, after which he took a gap year. He has done some part-time work at a local garage over the summer but is now concentrating on study.

Technical Skills and Preferences	James does all of his work in University as he struggles to concentrate at home with various distractions. This means he spends a lot of time in the engineering labs and computer suites. The phone is mainly used for social media and connecting with friends, he does not use the primary university platforms that much, only to access course content when required and to upload work via Moodle. The library is important for James because he needs to access core workbooks and certain manuals, despite a fair proportion of the course being practical. He uses a Windows based machine because of the 3D automotive modelling applications that are required for his course.
<i>User Motivations</i>	
Goals	• He socialises a lot outside of study with his University friends, so likes to keep tabs on the SU ran/sponsored events. • Does appreciate MyDay as it allows him to access some of the core student services such as OneDrive which he uses to store his practical log files. • Some highly specialised software is required so he must access the student software repository to obtain copies and license keys.
Discomforts and Irritations	• Incorrect timetables and not being notified about lectures being cancelled, particular at short notice. • Not being able to locate fundamental text books via the library website. • Struggling to find some software via Microsoft DreamSpark.

C. User Stories

User stories typically take place after a range of example users have been documented. The purpose of this activity is to be aware of how a given user could wish to interact with the system being developed and crucially how an individual's goals, use of devices and potential frustrations help the developer design the configuration of system information [10]. Given the sometimes 'fuzzy' nature of a user's perspective on a system this process does not

concentrate on how a developer should solve design quandaries, just that they need considering in the new or revised system. The purpose of a scenario is to “concretely describe” [11] the use of a system, allowing the development team to attempt to most closely replicate the route that users take in a system to achieve a certain outcome. This “essence of an interaction design” takes an individual and creates a narrative in which the users, often identified in a physical state, describe and demonstrate their motivations, actions, current understanding and controls and/or interfaces that they “encounter and manipulate” [11] during this journey; often following the follow format

“As a <type of user> I want to <some goal> so that <some action>” [12]

In the following sections *i.* to *iv.* a user story has been developed for each persona identified above, outlining the mental and physical processes involves with completing a task that is appropriate for the activities associated with that individual.

i. User Story A: Persona A

*Ollie has arrived in University at 8:30 on a Tuesday morning and has a morning free of lectures. He is in early so as to continue with assignments that he has to hand in later in the month, so is looking for somewhere quiet to study in peace. He finds a space in the library and decides he first wants to open a PowerPoint presentation from one of lectures yesterday to pick up the notes from where he left off. He logs on to his Windows laptop and firstly opens his preferred browser, Chrome. In the URL bar he enters the following link, **<https://moodle.uwtsd.ac.uk>** so as to go to Moodle without using the University website at all. He has been doing this for the last 1 and a half years because he quickly learnt this link. Now Ollie is presented with the Moodle login page where he sees that he must log in to his university IT account. He duly completes his details with his ‘P’ number and password, clicking ‘Log In’ when complete. With success his is now shown the main Moodle page with this year’s module tiles arranged underneath a bar of other primary university links, such as Email and MyTSD. Ollie scrolls downwards to find the module he desires, Database Management Systems in this case, clicking on the tile to open it up. Once inside the module he scrolls downwards again to select the correct lecture notes to view – expanding the tile and clicking on the PowerPoint file to download it to his machine. As he keeps local backups of each week’s content, he wishes to save the file to his OneDrive, and so navigates to the corresponding folder in the “Save to” file explorer window. He clicks save when in the correct directory and minimises Moodle and the browser window so as to view the PowerPoint file – duly continuing with his note taking.*

ii. *User Story B: Persona B*

Ella has just finished a lecturer and is walking out into the main foyer from the Engineering faculty. She has completed an assignment and must now print a hard-copy for hand in later that day. To do this she wishes to find an available open-access machine in the Foyer to quickly print off the document. She sits down at one machine and turns it on, logging into the main Uni network. When logged in she opens her browser and is presented with the MyDay tiled interface. Her file is currently on OneDrive and so clicks the “My OneDrive”. She doesn’t need to sign in to the Microsoft account and so can navigate straight to the document through the file structure. She finds the file and selects it, opening the document through Word online in another window. From here she selects the “Print” button in the top right-hand corner of the ‘actions’ banner, prompting a dialogue box with printer settings. She wishes to print single-sided and in colour and so uses the dropdown controls in this view to select these settings. Next, she clicks print, sending the document to the print server. She now takes out her student card and signs in to one of the open-access printers, clicking “Secure Print” and selecting the document from the resulting job list. This prints her document and it automatically clears from her account. She signs out of the printer and closes the browser window on her computer, before logging out of the machine and heading to the café to get some lunch before her afternoon classes.

iii. *User Story C: Persona C*

Matthew uses Adobe Creative Cloud regularly on the lab workstation machines during the day but has decided that he would like several core CC programs available on the go on his laptop too. He is aware of the university software store where he can download a new copy using the student license code and application file(s) available on the student software portal ran by Microsoft, DreamSpark. He opens a browser and is firstly presented with “MyDay”. Given the product he wants he clicks on “Office 365” to see if he can find access to DreamSpark this way. However, this route does not provide the correct methods to access DreamSpark as it cannot be found on this site, it instead displaying Microsoft products that he already has. Matthew realises he must find another way. Returning to “MyDay”, Matthew feels that searching the UWTSD website should bring this up yet going to “Search” and entering “DreamSpark” returns no results – again he can clearly see that this action has been unsuccessful. Starting back again at the UWTSD homepage Matthew wonders if this is available under “Quick Links”, so tries this route to see if anything can be found on this page. ‘Information Technology and Systems’ looks possible, so clicks here and sees “IT

Exclusives". He feels he is getting warmer now and scrolls down this page before seeing a small paragraph about software discounts - "OnTheHub", with a possible link, seems likely.

Matthew signs in after clicking the link and is then presented with search box where he promptly enters 'Adobe CC'. This however returns no results, so he clicks "Back" in the browser to return to the blank search box. In the text description underneath, he spots a discrete link taking him to "OnTheHub eStore" where the package he is looking for is clearly displayed. He reflects on this thinking that this is a strange process as the original store within the University website did not contain any products. He browses the package for a short while before deciding that some applications within will be useful for him. Clicking the "Get it Now" link, he is taken to the Adobe website where he sets the correct billing preferences and creates his own account with Adobe in the process. Given the cost of the software he would like to claim back the cost of this subscription fee for the student edition, but with a lecture staring in 20 minutes, simply checks the product out with Adobe, closes the open browser window, shuts his laptop and gets on his way. He would later go back to download the relevant cloud applications from the CC desktop client and submit the total fee on an educational bursary application form.

iv. *User Story D: Persona D*

James has just finished his first semester of his second year and only has one term left of his HND. To celebrate the end of the semester he is planning a night out in Swansea with friends from his course and others from the faculty. He is open to various suggestions that friends have as to locations and would just like to check the TSDSU events page to see if there is anything being sponsored or ran by the Students Union that could be of interest, just to be sure they are not missing something fun. He is on the way into Uni and would like to have a browse on his phone, so pulls out his iPhone SE, he calls up Safari and types in the university home page. Once here he clicks on "Quick Links" and then scrolls down to "TSDSU". On this page James scrolls downwards, but sees nothing here that really captures his attention, or lists containing upcoming events. Having returned to the top of this page he clicks on "Menu" and sees a dropdown appear. Here James thinks "Activities" will contain the information he wants, so selects this item. Once here he is presented with a menu list and menu tiles – both appearing to show the same items, selecting "Events" he then sees that they can be filtered by campus, so he selects the Swansea option here. Scrolling down the following list of events, and through several pages selecting "Load More Events" there is nothing that really catches his eye, so simply exits the application by swiping left to close the Safari tab and then by pressing the home/Touch ID button to return to the central iOS applications 'springboard' screen.

III. INFORMATION ARCHITECTURE

The Information architecture is of utmost significance in the development of software applications as it shapes the design and development of subsequent software components and front-end interfaces used, the latter an element of software that a user will ultimately interact with [13]. As such, user displeasure at being unable to find the desired information is aimed, commonly, at its ‘invisible’ composition [13]. The information architecture used in this application is relatively shallow because of the number of clicks required to access the desired information [14]. One of the primary issues with the existing website is the complexity of its information architecture and the number of menus, sub-menus and corresponding clicks necessary to access certain pages, especially those related to lecturer contact information which is particularly deep despite the fundamental need students and other lecturers have to find this information.

The structure of this system is polyhierarchical [14] for the reason that it accommodates the multi-route nature of mobile application use. In many instances’ users expect to be able to access certain menus from various, or in some instances, any given page - user settings being a prime example. The concept of ‘everything in 3 clicks’ has traditionally been a fundamental design rule but is often very difficult to maintain, instead helping to raise the importance of a “*comfortable path*” [14] whereby users can clearly understand and evaluate the demands of the interaction [14], a now standard approach to design problems. An all-encompassing definition of information architecture is offered by Rosenfeld, Morville and Arango [13] as;

“The synthesis of organisation, labelling, search and navigation systems within digital, physical and cross-channel systems” [13].

Rosenfeld, Morville and Arango justify their reference of several definitions highlighting the incredibly diverse nature of information structures that underpin “*digital products and services*” [13]. Alternatively the Information Architecture Institute (IAA) have simplified this possible definition down to “*The structural design of shared information environments*” [15]. In terms of the scope of information architecture its composition is widely understood to revolve around three main components “Users”, “Content” and Context” [13]. This principle is seen in the IA Venn diagram, shown in **Figure 1**, which illustrates how an information architecture is directly influenced by how the various facets interact with each other, a factor clearly seen in development of the university website as the focus of the main homepage is clearly centred towards promoting the establishment with less focus on providing easy access to student software services.

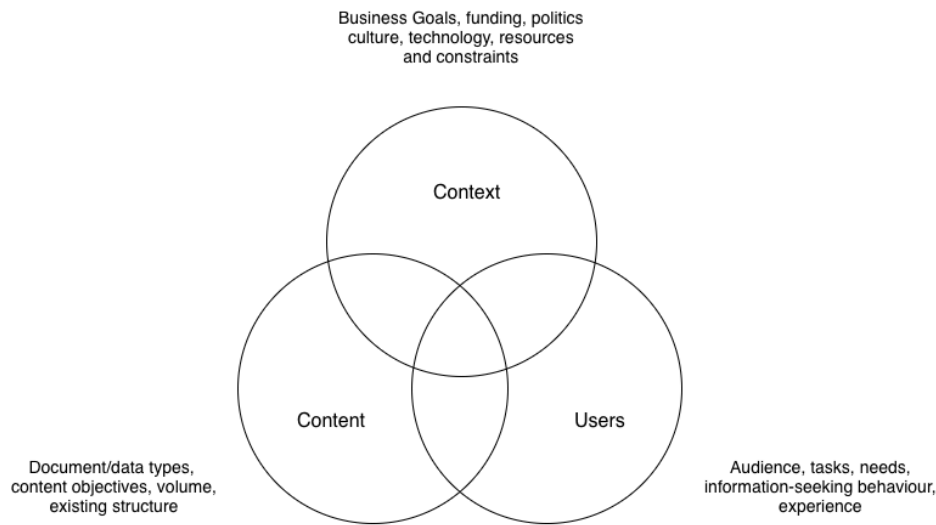


Figure 1: how the facets of IA are interrelated [13]

The task facing many systems is the need to develop an information architecture that provides a “*foundation for rapid response*” [16] and the continual change of digital platforms today. This element of flexibility has a reduced significance in the development of a campus companion app thanks to the relatively rigid nature of core student platforms and services that are unlikely to change on a regular basis.

- Illustrated below in **Figure 2** is a suggested information architecture for a FACE companion mobile app, consisting of five main pages that categorise the main facets of student IT services within the university with ‘My Student Platforms’ containing the core platforms students most regularly use during the day, each platform listed here will have its own central page, itself containing the actions relevant to that service, such as Moodle in which a student’s enrolled modules will be displayed statically (as shown in **Figure 14**).
- ‘My Timetable’ contains all timetabling notices, schedules, lecturers, meetings and events for a student’s day-to-day activities. Of note here, and a separate feature to the standard module timetable is ‘Module Notices’. This page refers to the posts that lecturers can send out via Moodle to all students that are enrolled on a module. The ability to view these separately, as part of the timetable page is of value here because notices posted here could directly influence a student’s day on campus and not clearly obvious in Moodle’s module view. Bringing this feature out of Moodle increases its value to the student.
- With reference to the importance the requirements elicitation group placed on library resources this has now has its own menu and is accessible from the main page. Under this ‘tile’ options will be available to ‘Browse Subject Journals’, ‘Search the Catalogue’ as well as the option to reserve books. The ability to search being highlighted by several FACE students in the user requirements gathering stage. Closely

related to the source search feature is the option to contact the appropriate member of librarian staff by sending them an email from the library branch of the app.

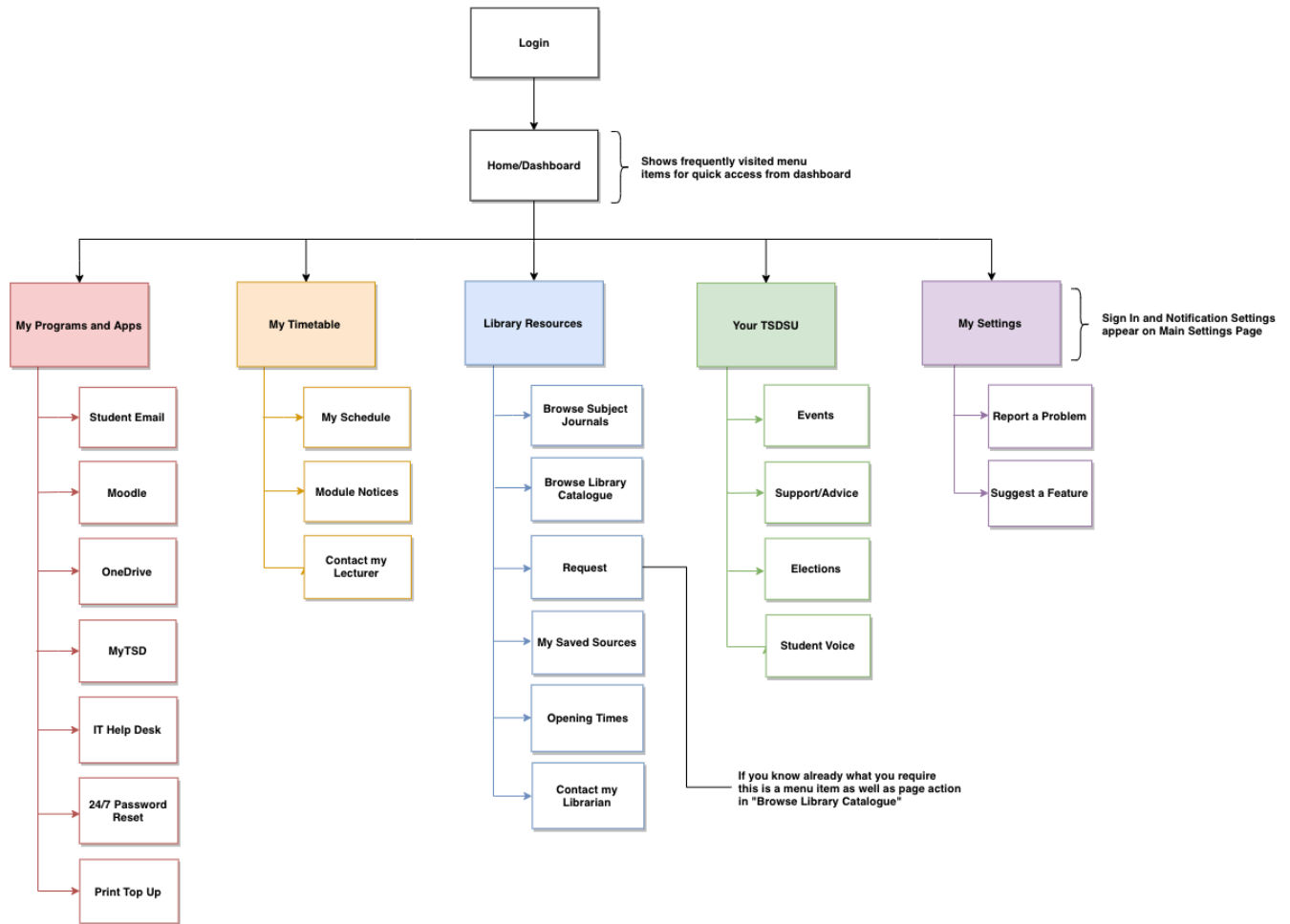


Figure 2: A possible information architecture

Although the application is initially designed at students a campus companion app could also be useful for staff. A possible Information Architecture diagram for staff is illustrated in **Figure 3** below, should the application be considered enough of a success to extended it in the future. The applications and tools used by a lecturer vary to that of a student, a factor reflected in the tools and applications and naming conventions used in this schema.

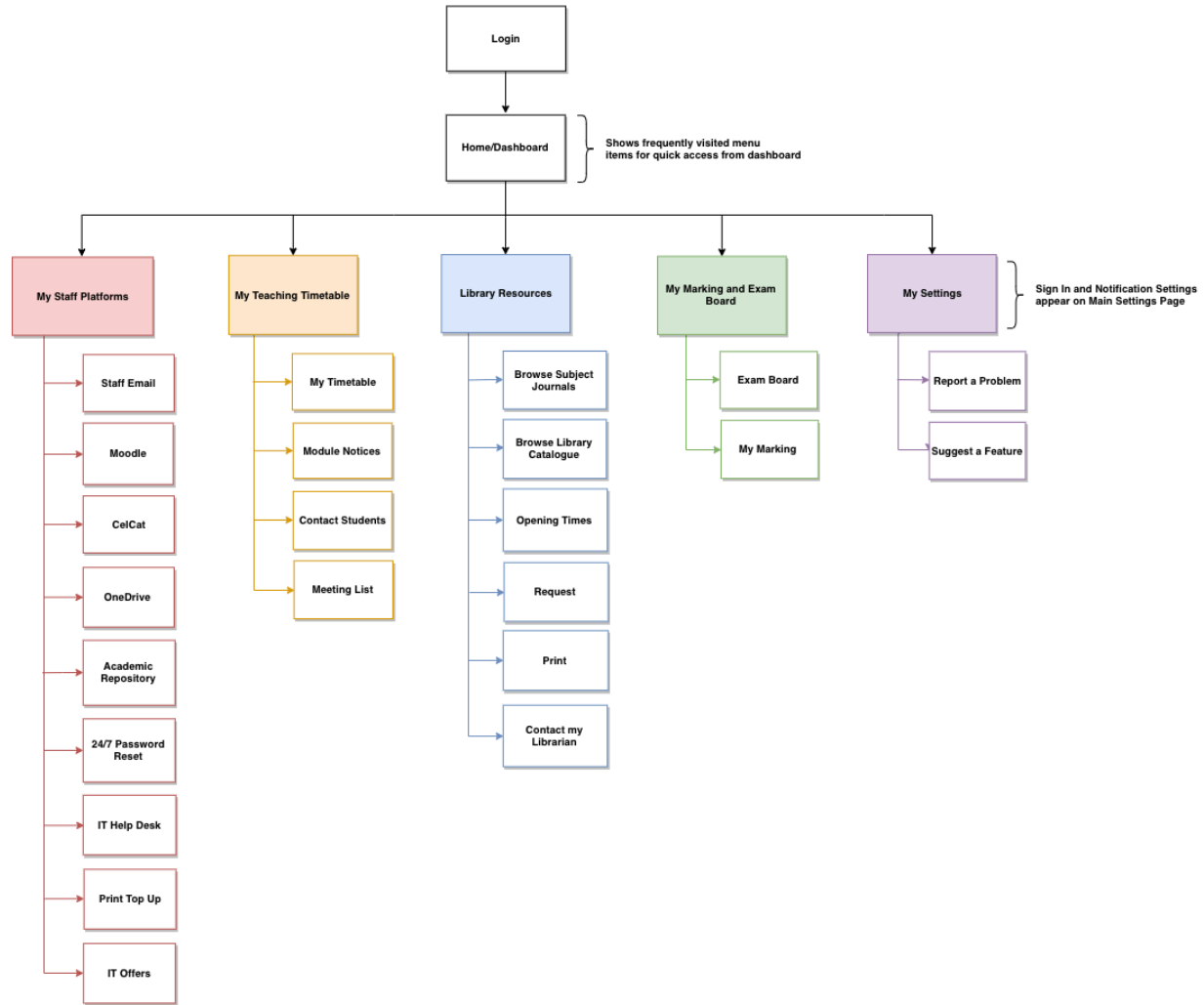


Figure 3: A possible information architecture if extending to staff

As a member of lecture staff, they might not need to access many of the platforms or tools that a student does, such as TSDSU, instead requiring functionality related to marking, assessment grading and exam board submissions. Some options they might rely on just as much as students, those possibly being ability to contact relevant library staff or the IT help desk to reset passwords or the like.

Once a successful design has been drafted and is considered suitable, the initial interface and physical structures with which to present this information can start to be [3].

IV. INTERFACE DESIGNS

A) Learning lessons from the UWTSD website

Having consulted the applications user group to identify their goals and motivations, suitable design mock-ups can be created that suitably present the information architecture developed in *section III*. Before offering conceivable mobile device designs it is important to first inspect existing interface designs. Evaluating the UWTSD University website highlights several key interface design elements that a new mobile-based platform should avoid in order to offer a suitable experience for students on and off-campus.

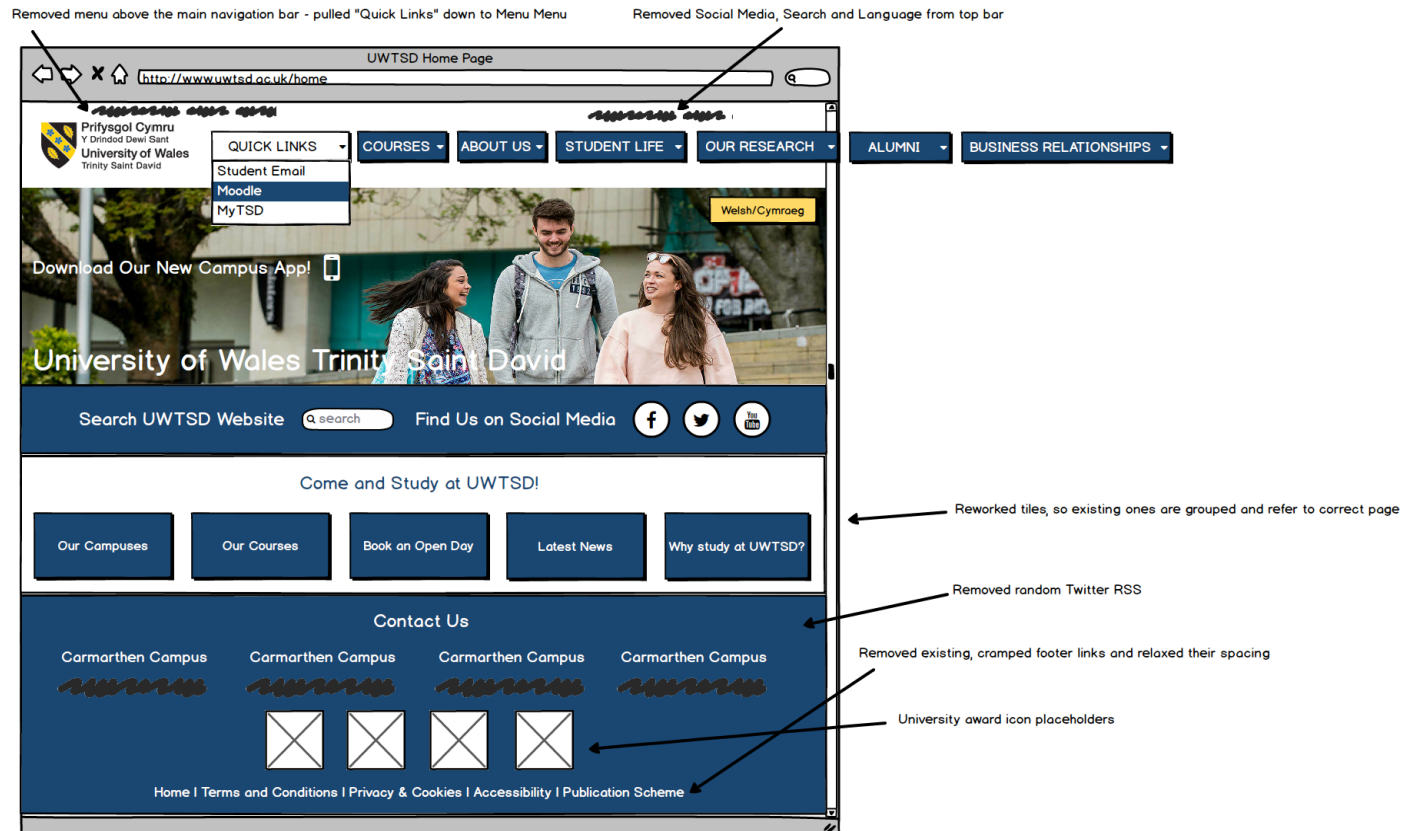


Figure 4: The existing website reworked in places, highlighting original design failings

Figure 4, illustrated above, highlights some fundamental interface design failings with the existing University website whilst also offering several alternative design options, some of which can be taken forward directly into the interface of a new, concentrated mobile application for students. The elements in the website are briefly acknowledged below;

- The menu structure is inconsistently arranged and displayed from a from hierarchical and design perspectives respectively. The use of two top menu bars, the primary one for current student resources being ‘Quick Links’, is far from prominent and located directly above the primary page menu. The on-site resources students use rely on, such as Moodle and student email, will need to be central in the mobile application design in order to provide easy access to core services used frequently by staff and students alike.
- The existing website concentrates heavily on advertising the university to new students. A suitable mobile application for current students on campus will not need to include as much information on the university and its courses. A good application should include options to search and view course, faculty and staff information, but this functionality should not be considered a primary goal of a user.
- In the adjusted UWTSD website below the Welsh language option is of considerable value but could benefit from added visibility and centrality. The option to view the site and its content in Welsh should also be of considerable note for a campus companion app.

B) Designing and Developing Mobile Interface Wireframes

i. Wireframe Designs

Acknowledgements:

- For the purposes of this design process the mobile device used is the iPhone X/10 screen size. this screen size has been selected to represent a ‘typical’ mobile device.*
- Currently stand-alone mobile applications already exist for Moodle, Outlook and OneDrive but it is assumed that the companion app will integrate these, as illustrated below, to avoid the need to install each individual app.*
- Where controls appear below the bottom of the screen a downwards scroll is inferred.*



Figure 5: The 'P' number and password sign-in screen

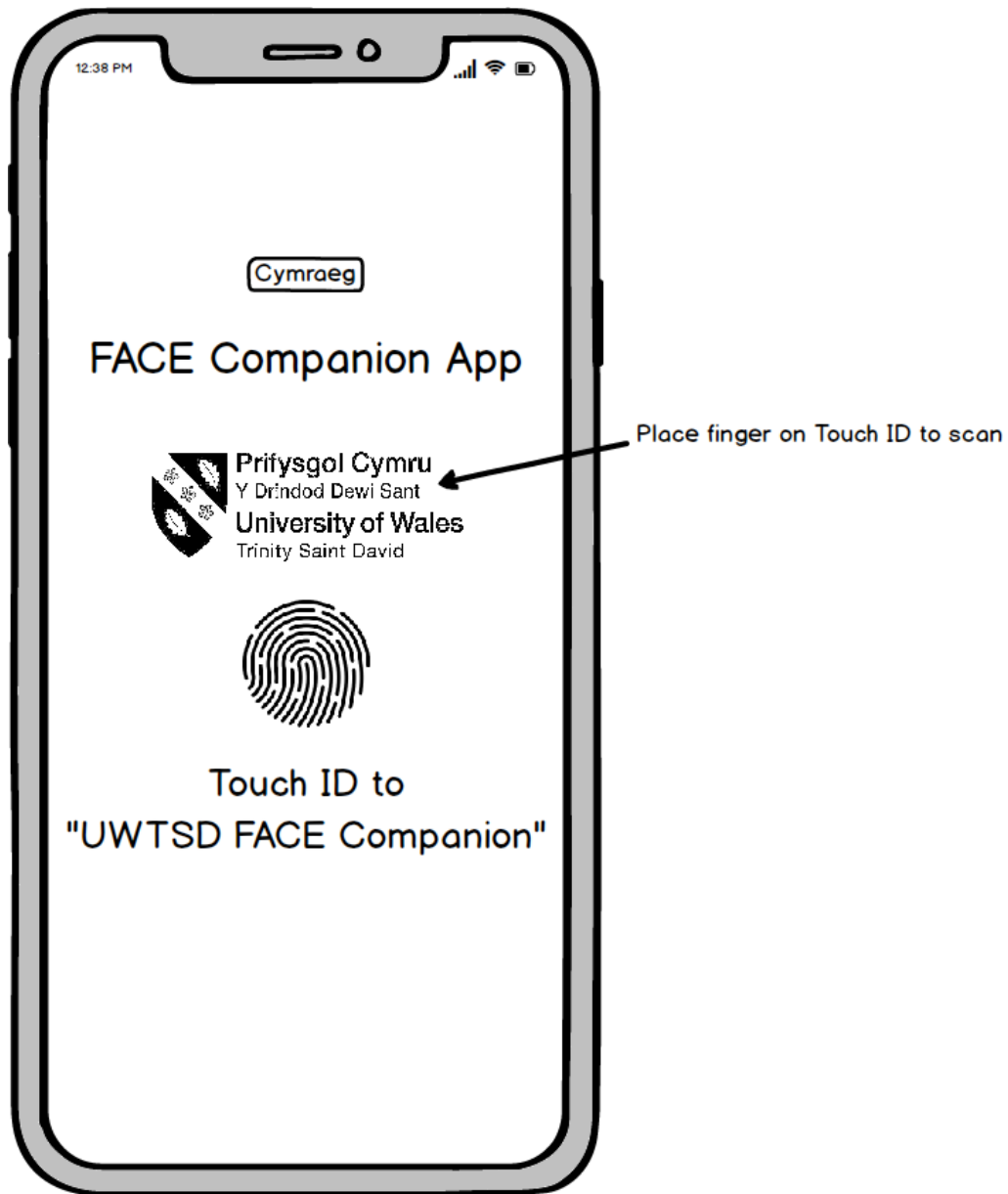


Figure 6: App could support 'Touch ID' in iOS

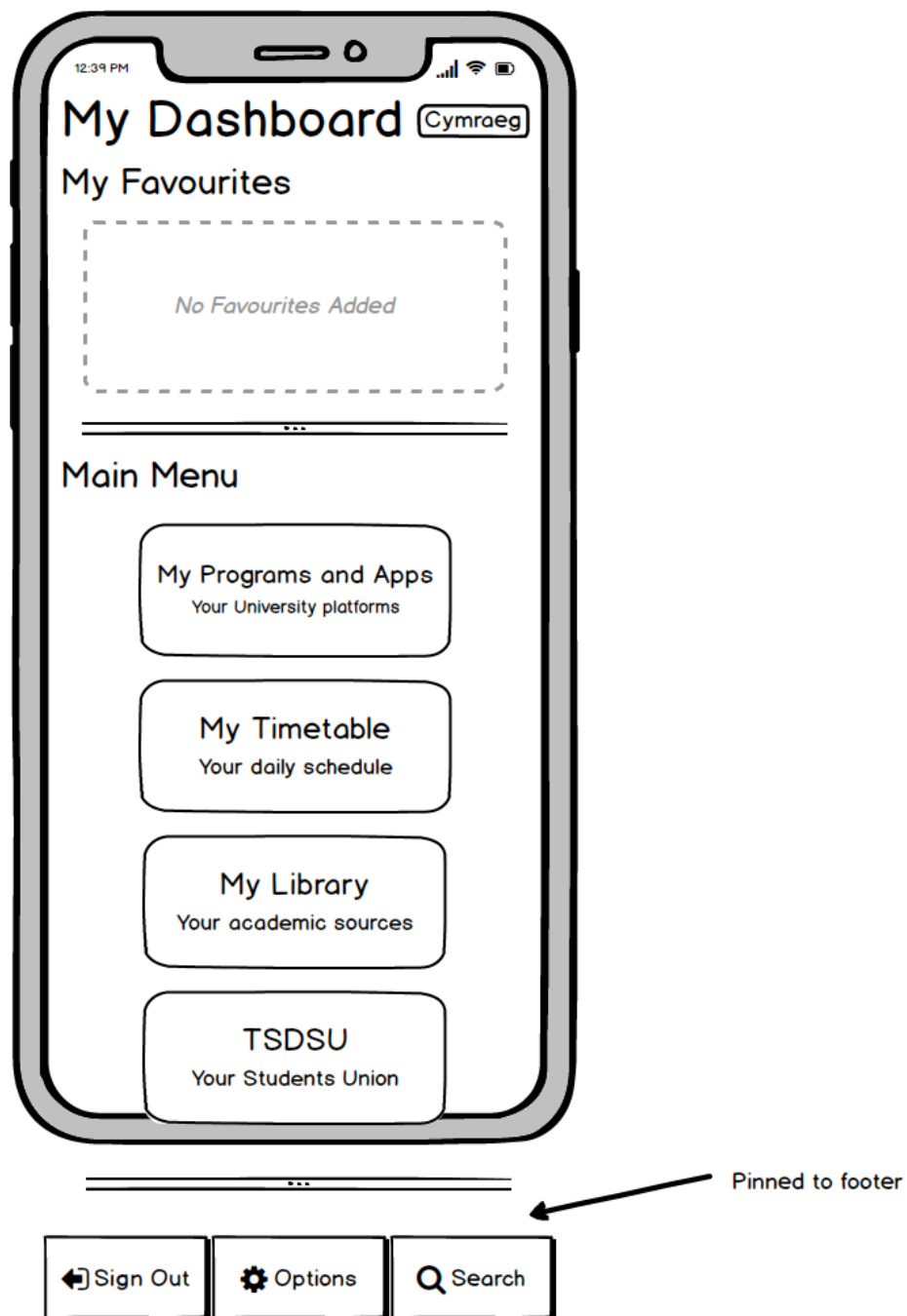


Figure 7: 'My Dashboard', the central view with 'Faves' and Main Menu

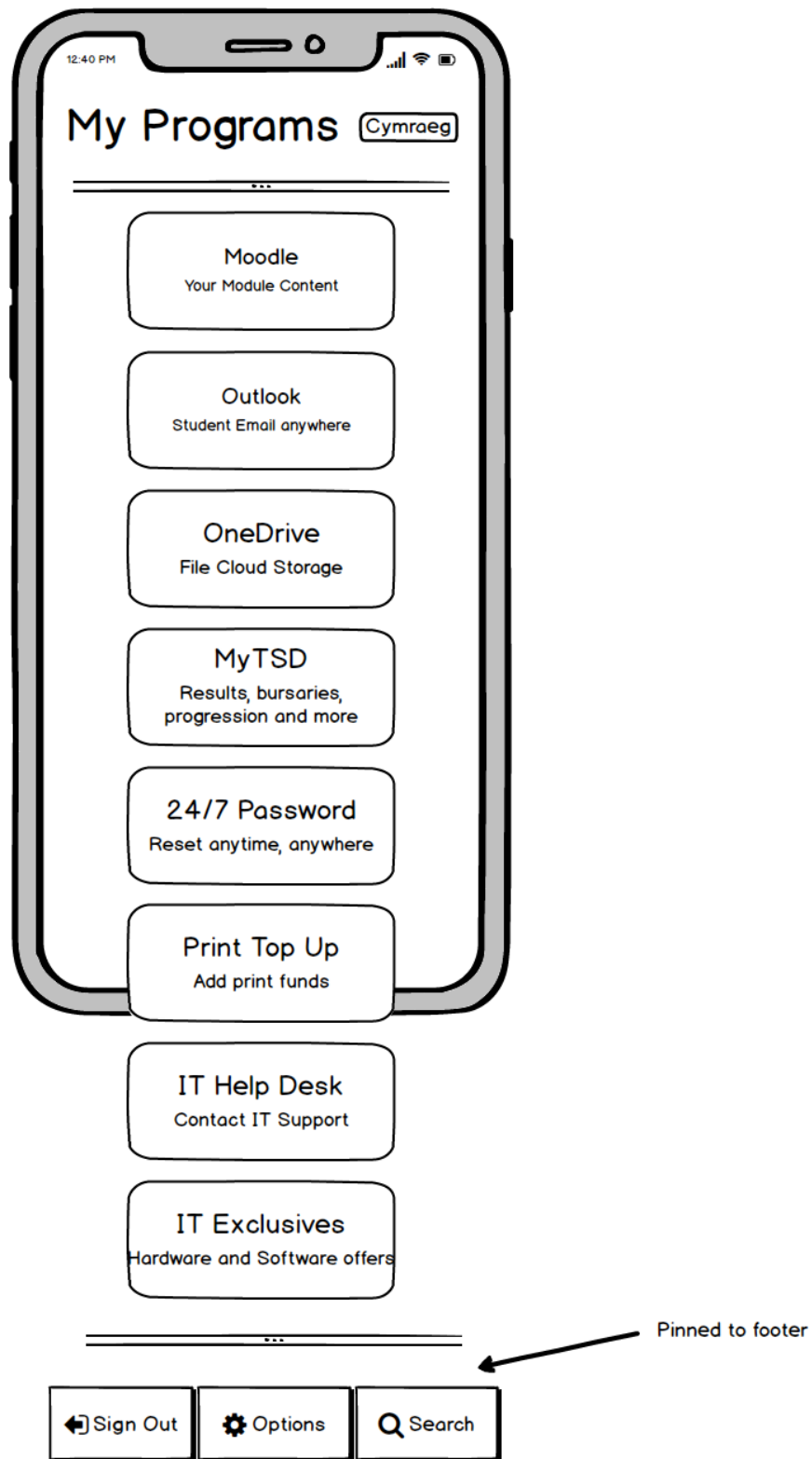


Figure 8: The 'My Programs' screen with a level 2 menu list

ii. *Justifying Principle Design Choices*

A new system should be intuitive to use, an important attribute to respect when designing an application to help streamline life on and off campus for FACE students. A piece of software can be considered intuitive if ‘*the users’ subconscious application of prior knowledge leads to effective interaction*’ [17]. Given the day-to-day experience most students have with core software applications and platforms within university, a degree of prior understanding and knowledge can be built up over time, a stem of system understanding noted in **Figure 9**, (below) and categorised as a *sensorimotor* process as this level is described as “*general knowledge*” [17]. The level of student familiarity and understanding of sites such as Moodle and Outlook can also be placed in this model as a *cultural* influence. This can be most clearly seen in various FACE faculties as the nature of university systems used, and the beliefs associated to their usefulness will vary by faculty. For example, the author as a computing student has different cultural stimuli to that of an architectural student residing in the same faculty because of the nature of the course and the lecturers who use and discuss the various day-to-day software platforms.

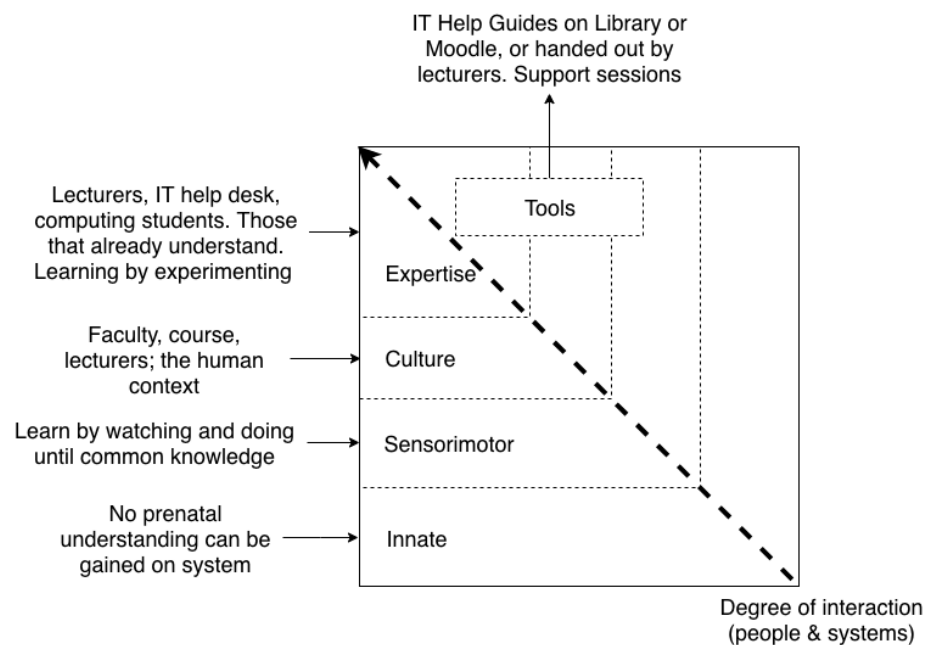


Figure 9: Continuum of knowledge in intuitive interaction. *Adapted from [17]*

A heuristic evaluation and walkthrough are important so as to place widely accepted usability principles against a new application. Due to these factors and the importance of course, faculty and other factors the following design decisions have been made with the process of infography, the “*practical formation and execution*” [18] of interface design that includes graphical and non-graphical components in a manner that clearly and effectively

conveys application meaning and purpose so as to provide pervasive user understanding [18]. The primary screen designs, shown above in *section IV. B). i.*, and in Appendix *section VIII. A)* have considered the following design elements. At the apps centre is a dashboard where users will drilldown to find more information, being presented with several generic elements of university life such as Library. The dashboard concept is good for displaying customisable content whereby the user can select the items that appear on screen, typically one central to the application [19], another important aspect of this page as it allows users to ‘add’ quick page access to the top of this first screen, an element of functionality being offered by an individual in the requirements and features gathering process.

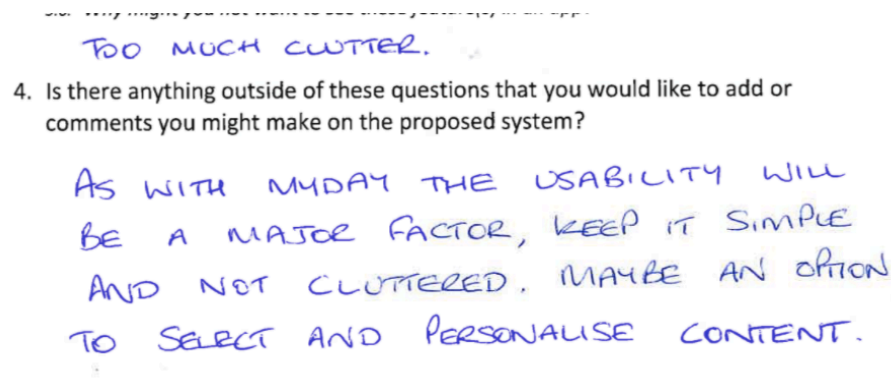


Figure 10: Suggesting personalized app content

With a dashboard at its core the rest of the apps navigation works around the conventional List Menu Design Pattern [19], illustrated in **Figure 7** and **Figure 8** amongst others. Here icons have been placed on the buttons, providing a listed (opposed to gridded) structure; almost making several pages a combination of both the ‘List’ and ‘Springboard’ concepts. Both iOS and Android device users, are likely to be very familiar with this type of control and so it is well suited for this platform [19]. Each screen also contains a tabbed footer, following the concepts of a design pattern of that name [19]. Working most naturally at the bottom of the screen these options are designed to be quickly accessed, enabling a student to quickly Sign Out or access app preferences at a single touch. Following the ‘How To’ help designer pattern, this arrangement provides the user with a channel to contact the developers too report problems and errors from one central location, accessible from any page [19].

Each Main Menu item, the list of which is shown in **Figure 7**, will be driven by secondary navigation tools [19]. In **Figure 15**, the expandable module headers list could be considered a secondary control as they allow the user to view files organised within that sub-menu [19]. Not categorising the module content under headers in the mobile app could result in long, unbroken headers, text and an overpowering amount of vertical scroll. The issue of orientation is complex, especially given the understanding that users might not be viewing on a smartphone, rather a tablet. By not changing the screen orientation at all, the information architecture, and overlying interface revolve around vertical list options, far more suited to tight display dimensions [20].

V. USER TESTING

To help evaluate the suitability of the application interface, the use of a user acceptance testing, typically through mediums such as evaluations and practical tasks. Whilst the latter is of importance to understand the thought process of target user groups its benefits are limited thanks to the limited nature of initial wireframe designs and the relative extent to which users can explore the initial application designs in the process of test task fulfilment. The ultimate goal being “*conceptual integrity*”, and “*underlying consistency*” [21]. The use of Likert-based model, such as offered by Brooke [22] and illustrated partly in **Figure 11**, is suitable thanks the broad questions that help evaluate the suitability of an application interface, it is useful also to understand the precise extent to which elements of the system are suitable [22], contrasting with tests that provide clear, distinct outcomes.

5. I found the various functions in this system were well integrated	<table border="1" style="border-collapse: collapse; width: 100%; text-align: center;"> <tr> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>						1	2	3	4	5
1	2	3	4	5							
6. I thought there was too much inconsistency in this system	<table border="1" style="border-collapse: collapse; width: 100%; text-align: center;"> <tr> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> <td style="width: 20%; height: 20px;"></td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> </table>						1	2	3	4	5
1	2	3	4	5							

Figure 11: The qualitative nature of a Likert-based model

A) Testing Itinerary

In order to test the usability of the developed wireframes several user tasks must be developed during which their actions, thought processes and comments can be observed and noted with the aim of understanding the usefulness of the current system prototype [23]. The test script, as illustrated in **Table 7**, has been adapted from a highly popular framework devised by Krug [24] whereby the test revolves around scenario tasks for a participant to complete, commonly in the format of “*How would you find _____?*” [24]. The sheet initially defines the test boundaries and how the process works in order to give the participant the complete picture. Giving an individual the space to act ‘normally’ allows them to perform in a more natural manner, meaning the results collected are more accurate of the users experience with the system [24]. Secondly come the scenarios, five in this example. These present various challenges for a user, giving them goals to work towards. Notes have been made during this process on the user’s thoughts, opinions, actions and in some cases, such as that carried out by *Ruth*, questions or queries [24]. The final questions ask the user to highlight any other points they might have outside the questions asked that they might have noted during the test.

Table 7: Usability Testing Script

Student University Companion App – Usability Testing Itinerary

1. Understanding the Usability Testing Participant

1.1. Name:

1.2. Age:

1.3. Course of Study:

1.4. Time:

2. Outlining the Test/Evaluation Process

2.1. Outline reasons for testing and what the test will involve

2.2. I am not here to influence you and your response to any questions that I ask

2.3. There are no right or wrong answers. I am testing the system we [the development team] have designed, and not you.

2.4. Do you have any questions about this test?

3. Test 1: “You have been into the library and have found a book you would like to take out, you now want to reserve it in the app rather than use the library machines”.

3.1. Test Processes, Outcomes and Interaction Comments

3.2. Was the text:

3.2.1. Size suitable?

3.2.2. Neatly and clearly positioned?

3.2.3. Was the terminology used familiar?

3.3. Were the buttons suitable?

3.4. Did anything not work spatially?

3.5. Any other comments?

4. Test 2: “View Student Union events happening on the Swansea campus, but get distracted and instead must quickly forward an urgent email you receive.”

4.1. Test Processes, Outcomes and Interaction Comments

4.2. Was the text:

4.2.1. Size suitable?

4.2.2. Neatly and clearly positioned?

4.2.3. Was the terminology used familiar?

4.3. Were the buttons suitable?

4.4. *Did anything not work spatially?*

4.5. *Any other comments?*

5. Test 3: *“View your timetable to see if any lecturers on today have been postponed”.*

5.1. *Test Processes, Outcomes and Interaction Comments*

5.2. *Was the text:*

5.2.1. *Size suitable?*

5.2.2. *Neatly and clearly positioned?*

5.2.3. *Was the terminology used familiar?*

5.3. *Were the buttons suitable?*

5.4. *Did anything not work spatially?*

5.5. *Any other comments?*

6. Test 4: *“Save your login details so that you do not have to repeatedly sign in and close the app, then decide to instead use the secure Touch ID as authentication instead”.*

6.1. *Test Processes, Outcomes and Interaction Comments*

6.2. *Was the text:*

6.2.1. *Size suitable?*

6.2.2. *Neatly and clearly positioned?*

6.2.3. *Was the terminology used familiar?*

6.3. *Were the buttons suitable?*

6.4. *Did anything not work spatially?*

6.5. *Any other comments?*

7. Test 4: *“Check to see if a lecturer has uploaded a file to the Database Management Systems module that you have requested them to add”.*

7.1. *Test Processes, Outcomes and Interaction Comments*

7.2. *Was the text:*

7.2.1. *Size suitable?*

7.2.2. *Neatly and clearly positioned?*

7.2.3. *Was the terminology used familiar?*

7.3. Were the buttons suitable?

7.4. Did anything not work spatially?

7.5. Any other comments?

8. Across all the tasks at any point did you feel you didn't understand or was not raised in any of the test scenarios that you experienced while using the app?
9. Having looked and explored a prototype companion app are there any additional features you feel would also be useful?

Thank you for participating. End of Test.

B) Evaluating Usefulness of Test Participants

This usability testing process was performed three times with distinctly different user groups with the aim of highlighting design and navigational inconsistencies with the first prototype system, the key findings of which are highlighted underneath a brief explanation of the users consulted.

- Johnathan Davis, 26, BSc Games Development, 2nd year

This user is a typical example of a FACE student in the SA1 campus and is likely to be a key user of a companion application. Despite a keen understanding of IT software development, their background in game development might not translate into a deep (and therefore biased) view and perspective on the usability testing process. His feedback could present some useful insight into this from an IT student's perspective thanks to the nature of his course. Johnathan also spends most of his week in University and studying, increasing his exposure to the components of the application, the upshot being a greater familiarity with the tools, platforms and options contained within.

- Peter Davies, 32, BSc Web Development, 3rd year

This individual, thanks to this particular course has a considerable understanding of usability concepts, despite this he is still a useful testing candidate. An understanding in usability principles from a web-based perspective, tied with a strong appreciation of what makes a system usable allows him to present insightful feedback to the developer with fresh, unbiased opinion of the system and its relative usability. Much like *Johnathan*, Peter relies heavily on platforms and services as he is currently in the latter stages of his final year.

- Ruth Melton, 21, BSc Architecture, 3rd year

Ruth, from the initial studies performed, has the least prior understanding of usability and so presents a “naïve” user who is using a new application for the first time, without much understanding of the concepts applied in its design. This view can present highly insightful information, be it through questions directed at the interviewer or simply talking through thought processes that might be simply assumed by *Johnathan*, or reserved completely by *Peter*, possibly because they were considered too obvious to point out to the test interviewer.

C) Results and Feedback Evaluation

With the usability surveys complete it is time to work through each test session ran in order to identify a list of concerns that users expressed, these are highlighted in the following points.

- **UWTSD internal library and Subject databases were being confused**

This feedback was not noted during the completion of any tasks, but as a question and comment for the interviewer when completing the exercise of quickly requesting a known book in the library. *Ruth*, whilst on this page, asked for clarification between the difference in these two pages, the answer being that “*Library Catalogue*” will take the user to the UWTSD library catalogue and the other, “*Subject Resources*” will open a page displaying the course subjects, and their recommended journal databases, accessible by the appropriate links. The labelling here is therefore misleading as is and needs alteration, despite the presence of small icons which were not considered helpful in this instance.

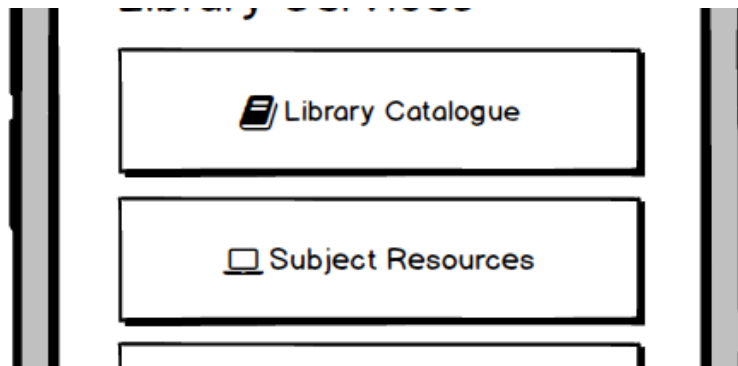


Table 8: UWTSD Library and Subject Database buttons are very similar

- **“Search” might be being overlooked**

Two out of the three individuals did not use the “Search” option when presented with a task that involved moving quickly from one section of the application to another. The natural instinct of *Peter* and *Ruth* was to simply find a “Back” button with which to return to the central “Home/Dashboard”. With only *Johnathan* seeing and using the “Search” button to call up Outlook its usefulness is either being overlooked, particularly by *Peter* who said such controls often “do not provide the results that I am looking for” [Peter, 32], or simply not spotted. In response to a “Search” button, *Peter* raised the related point regarding **an option to go “Home” instead** to enable a user to quickly and easily jump back to the start and begin a new flow of system interaction.

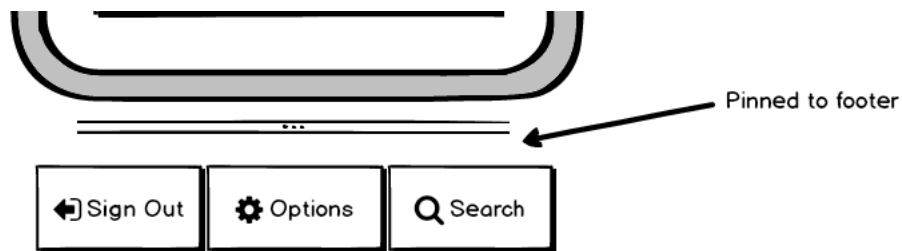


Table 9: “Back” to change section of app was used by some instead of “Search”

- **“Quick Request” is causing confusion**

During the requirements gathering phase the idea of a quick request system, designed to help speed up reserving a book, was generally supported. However, in this first development iteration its purpose and functionality has caused some misunderstanding and has raised some questions. Both *Ruth* and *Peter* were unsure as to how this feature could be used.

“Do I already need to have a book saved in order to quickly request it?” [Ruth, 21]

“Do I need to find the book in the app first?” [Peter, 32]

“What’s Quick Request?” [Both Ruth and Peter]

Issues were also expressed with the choice of the icon here, it intending to show an outstretched hand about to receive a book... However, this feedback is interesting as it was highlighted by an individual that is familiar with mobile and web application design, for this user an outstretched palm of a hand has other connotations.

“It looks like a stop or halt hand” [Peter, 32]

To solve this issue the next development iteration will need to decide if this button should not be its own menu, instead a function contained within a separate page; most likely one that is showing the options available to a user whilst viewing a particular physical resource.

VI. CONCLUSION

The purpose of this piece was to highlight how the processes of requirements gathering, and the support and central importance of the user throughout the initial design of a new digital product is fundamental. Despite several key errors found during the user testing stage, it can be seen that the consultation of real-world target user groups has helped the developer bring together a comprehensive desired features and functionality list, the availability of which in the app will ultimately define the value of the software by those that will use it. This broad range of thoughts and wishes have been constructed and placed into a format that enables a user-friendly interface to be placed on-top. Taking these initial graphical designs back to the user has raised several points that will now need re-evaluating in the next iteration of the mobile applications development. As such, the set of full interface designs developed in the future can be far closer to the final product outcome.

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VIII. APPENDICES

A) Interface Designs

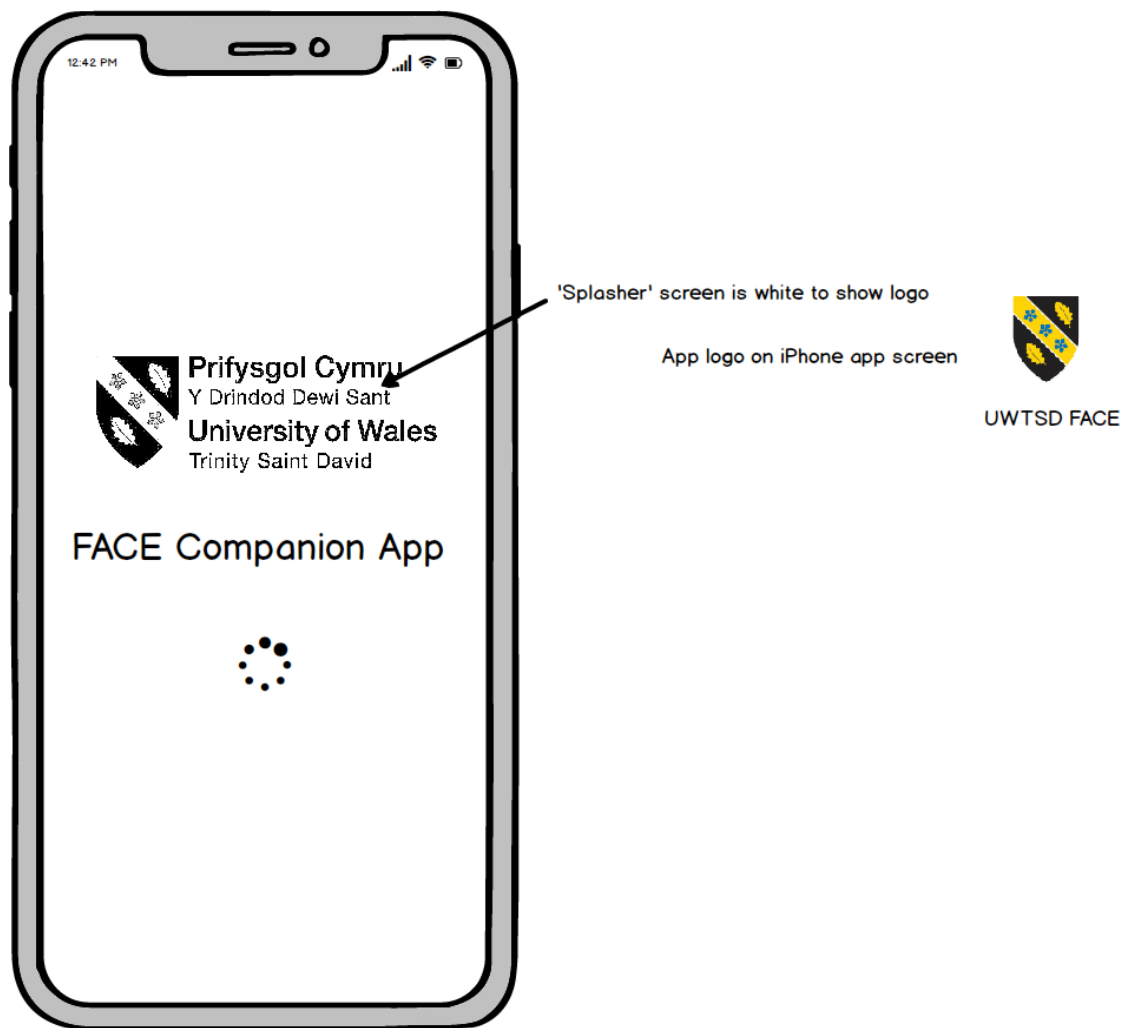


Figure 12: A splasher/launch screen

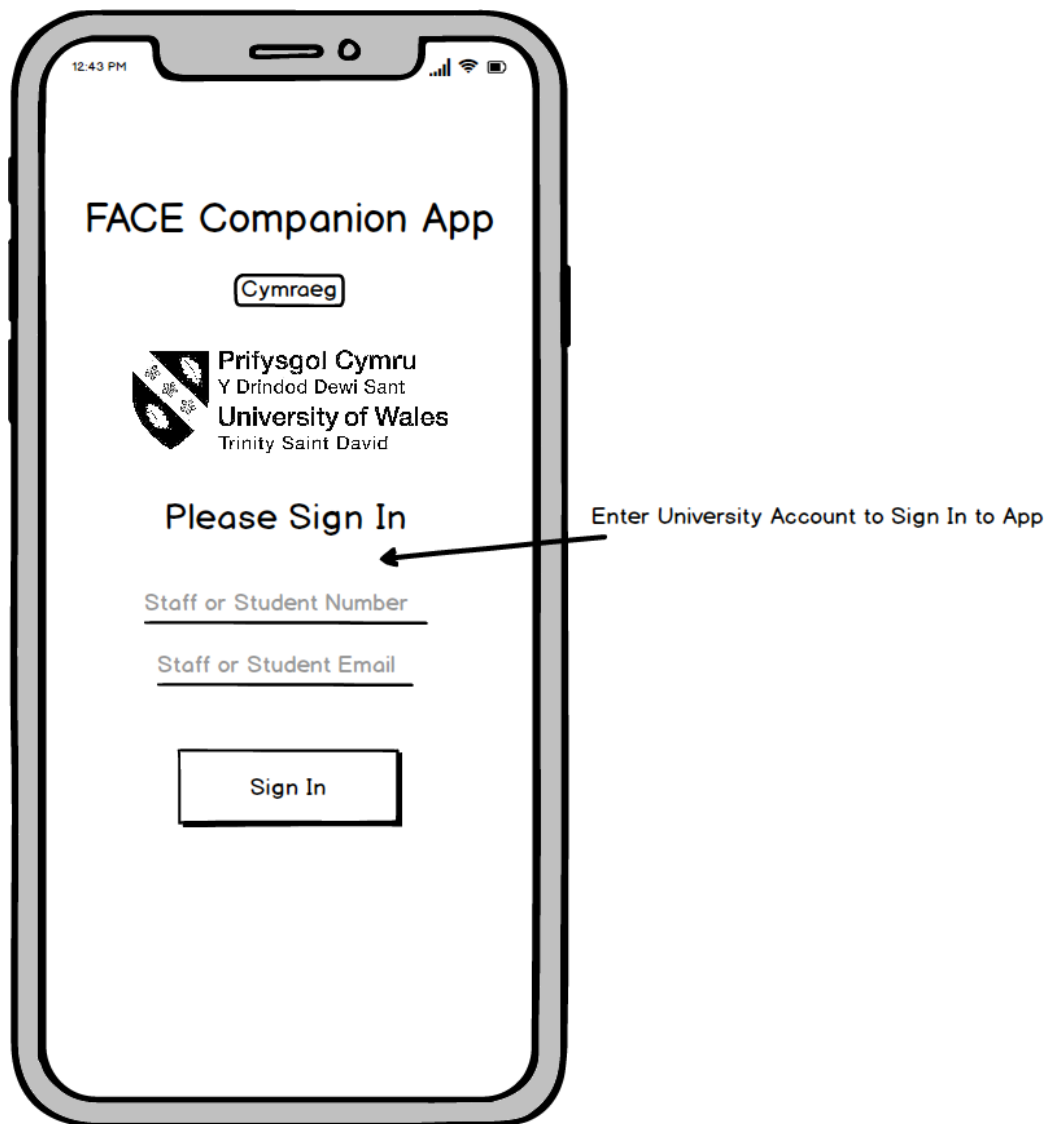


Figure 13: Sign In without keyboard

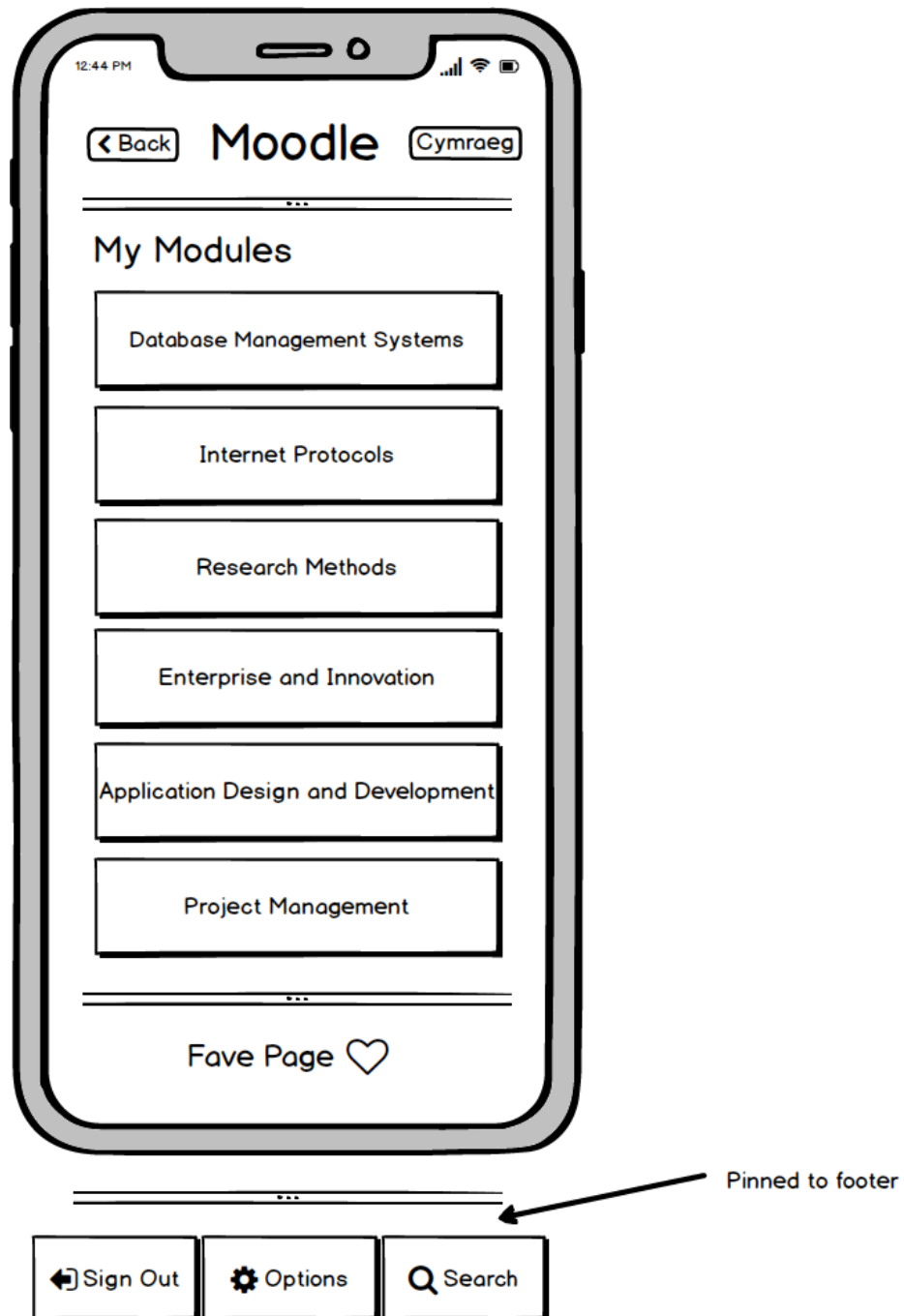


Figure 14: 'My Modules' view inside Moodle menu

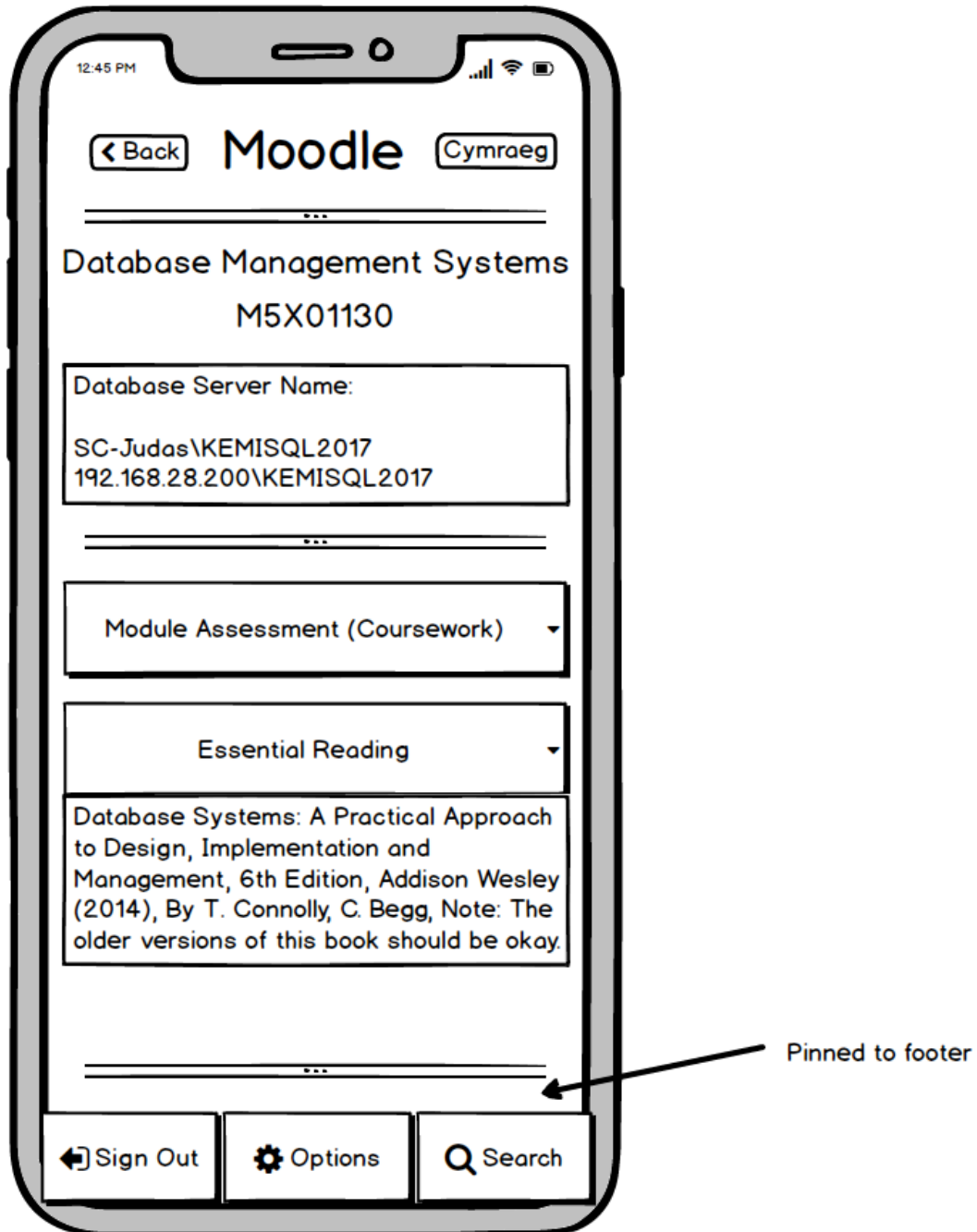


Figure 15: A possible Moodle module view with menu/content dropdowns

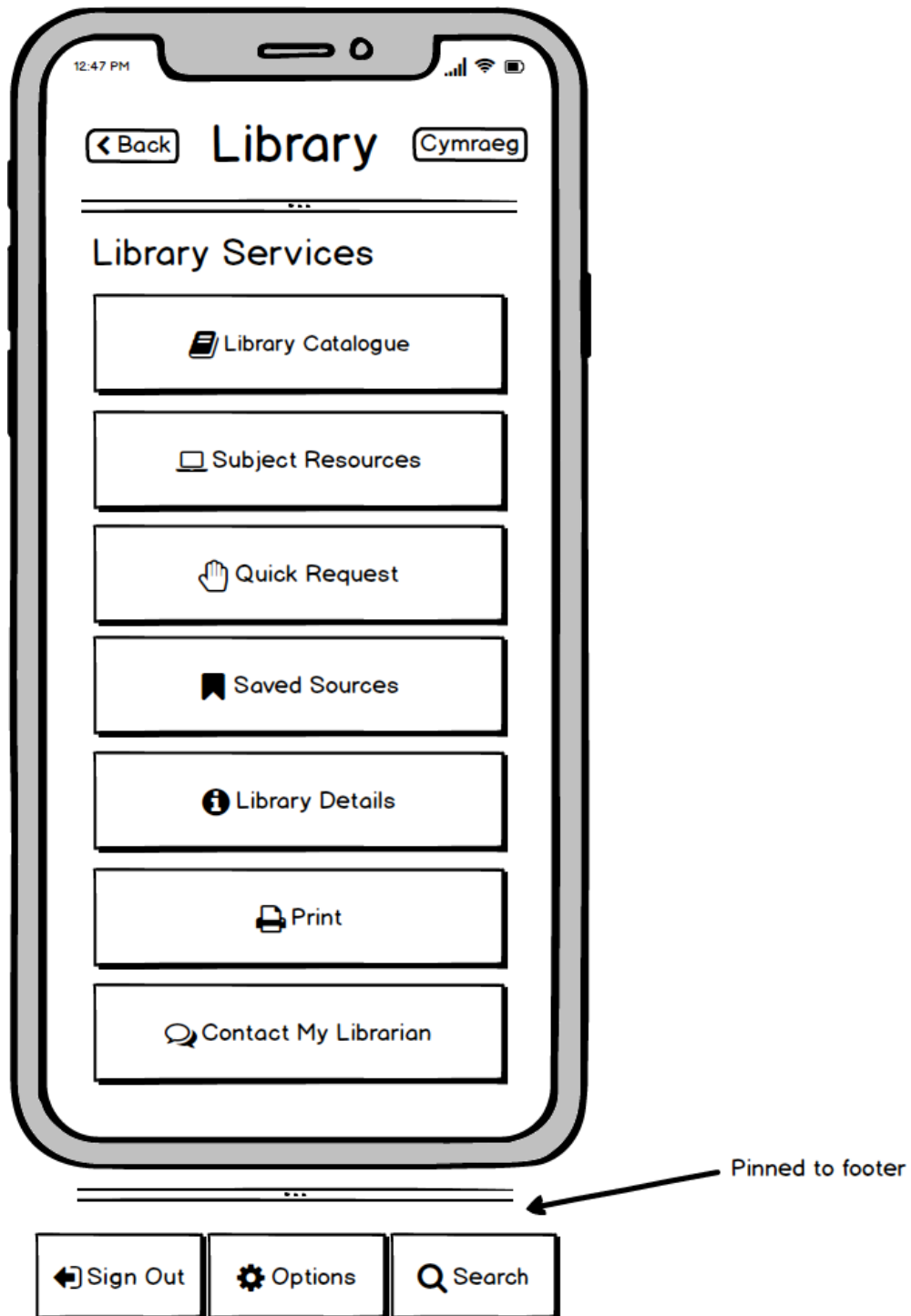


Figure 16: Options inside 'My Library' menu

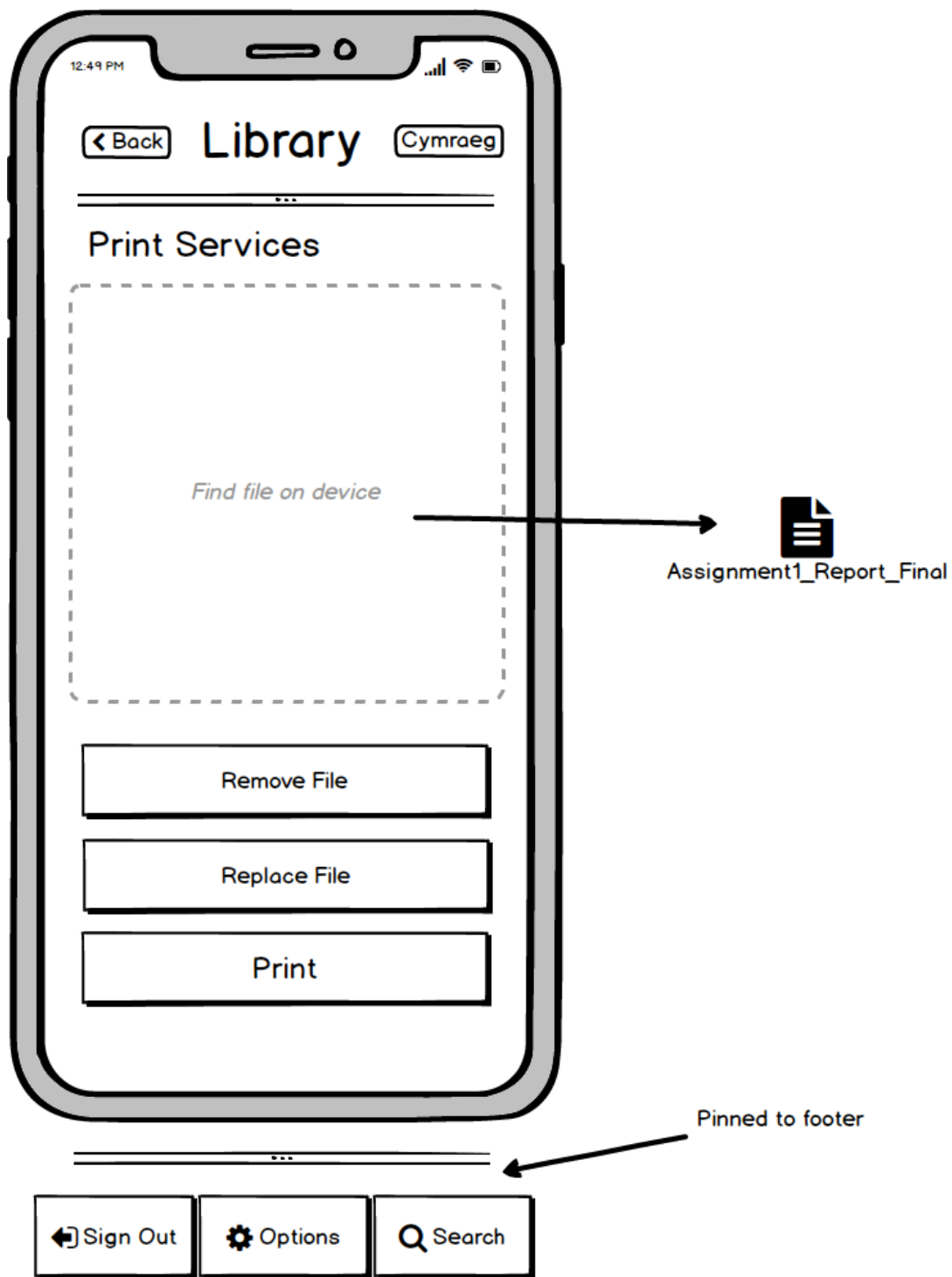


Figure 17: Possible controls for selecting a file from the device

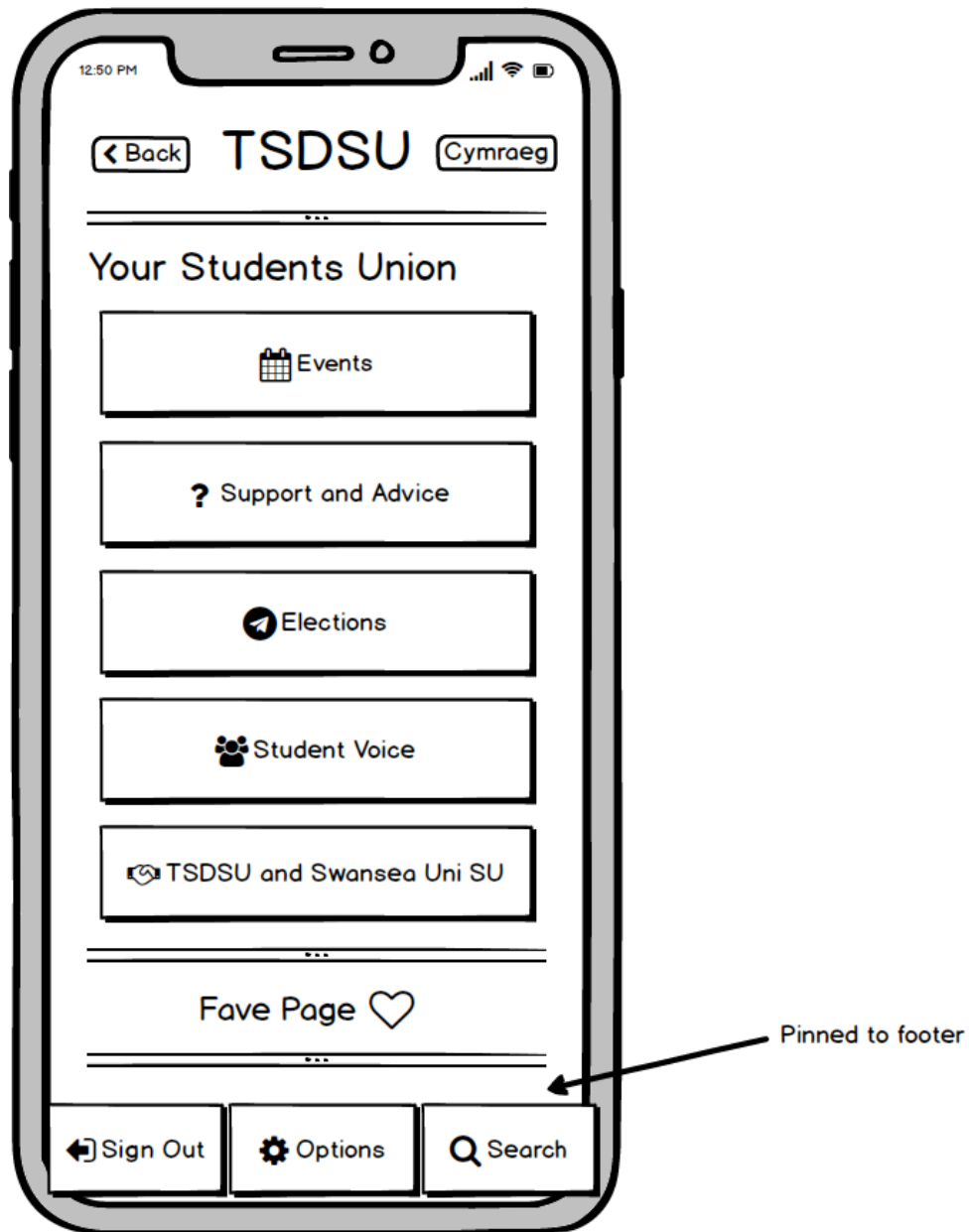


Figure 18: Options inside 'TSDSU' menu

B) Requirements Gathering Sheet(s)

i. Round 1 using initial requirements sheet

Student University Companion App – Requirements Brainstorm Sheet

Name: Jonathan S. Davies

- Courses: Computer Games Development

- Ages: 26

- Years of study: Year 2 (LS)

Time: 11:50 4/4/19

1. Understanding current software usage

1.1 What software do you currently use for your studies?

Visual Studio Enterprise

1.2 Why do you use it?

For programming

2. Assessing the suitability of the existing University Website

1.3 If you use the current website, what do you use it for?

Access to moodle, the online library and email

1.4 What do you like about the current website?

Quick Links options

1.4.1 Why do you like the[se] feature[s]?

Navigate to relevant pages faster

1.5 What do you dislike about the current website?

Overwhelming amount of user options/choices

1.5.1 Why do you dislike the[se] feature[s]?

Too many options crammed onto one page

2. Gauging the potential of a Campus Companion App

2.1 Is the idea of a companion app something that you would be interested in?

yes

2.2 What features would you like to see in a concentrated companion app?

one-click navigation, utilise finger-scan for login

2.2.1 Why do you want to see the[se] feature[s]?

Increased security and faster access

2.2.2 What is the one most important feature from this list?

finger-print login

2.3 When using such an app, what features would you not want to see?

Irrelevant messages / banners

2.3.1 Why do you want to see the[se] feature[s]?

Can be annoying

2.4 Is there anything outside of these questions that you would like to add?

Student University Companion App – Requirements Brainstorm Sheet

Name: DAVID JAMES

- Courses: COMPUTING (GAMES DEVELOPMENT)
- Ages: 29
- Years of study: 2

Time: 11:52

1. Understanding current software usage

1.1 What software do you currently use for your studies? VISUAL STUDIO

1.2 Why do you use it? COMPULSORY FOR THE COURSE

2. Assessing the suitability of the existing University Website

1.3 If you use the current website, what do you use it for? MOODLE +
ONLINE LIBRARY

1.4 What do you like about the current website?

ACCESSIBLE, EASY TO USE + CAN BE
ACCESSED ON A SMART DEVICE (PORTABILITY)

1.4.1 Why do you like the[se] feature[s]?

IT COMBINES INTO A GOOD EXPERIENCE

1.5 What do you dislike about the current website?

DOESN'T KEEP YOU LOGGED IN

1.5.1 Why do you dislike the[se] feature[s]?

WHEN RETURNING TO THE SITE LOGGING
IN EACH TIME BECOMES CUMBERSOME

2. Gauging the potential of a Campus Companion App

2.1 Is the idea of a companion app something that you would be interested in? YES

2.2 What features would you like to see in a concentrated companion app?

SOMETHING MORE STREAMLINED, TOWARDS
TOOLS STUDENTS USE FREQUENTLY (MOODLE)

2.2.1 Why do you want to see the[se] feature[s]?

DEDICATED TOOLS SO THE APP DOESNT
BECOME CLUTTERED

2.2.2 What is the one most important feature from this list?

SIMPLICITY

2.3 When using such an app, what features would you not want to see?

NO ADDED OPTIONS OR EXTRA TOOLS

2.3.1 Why do you want to see the[se] feature[s]?

SIMPLICITY WILL BE LOST THE APP
WILL DO TOO MANY THINGS

2.4 Is there anything outside of these questions that you would like to add?

Student University Companion App – Requirements Brainstorm Sheet

Name: Nicholas Jones

- Courses: BEng - computer sys, and electronics
- Ages: 37
- Years of study: Y2

Time: 12:21

1. Understanding current software usage

1.1 What software do you currently use for your studies?

Microsoft, Proteus Simulation

1.2 Why do you use it?

To gain experience with industry standard packages

2. Assessing the suitability of the existing University Website

1.3 If you use the current website, what do you use it for?

Main use is the use full links, Library, Moodle.
Checking staff details, email, putting face to name

1.4 What do you like about the current website?

easy to use

1.4.1 Why do you like the[se] feature[s]?

1.5 What do you dislike about the current website?

* Nick says none because

1.5.1 Why do you dislike the[se] feature[s]?

most links bookmarked *

* Only uses to look up

2. Gauging the potential of a Campus Companion App

formal procedure
forms *

2.1 Is the idea of a companion app something that you would be interested in?

Possibly

2.2 What features would you like to see in a concentrated companion app?

Links to online Library (or possible a search feature)

2.2.1 Why do you want to see the[se] feature[s]?

~~and to~~ Speed up research for referencing

2.2.2 What is the one most important feature from this list?

↑ only listed one.

2.3 When using such an app, what features would you not want to see?

adverts (dislike apps with many ads)

2.3.1 Why do you want to see the[se] feature[s]?

They annoy me

2.4 Is there anything outside of these questions that you would like to add?

Student University Companion App – Requirements Brainstorm Sheet

Name: *Cory Nicks*

- Courses: *mcomp 56*

- Ages: *22*

- Years of study: *4*

Time:

1. Understanding current software usage

1.1 What software do you currently use for your studies? *MENDELEY, MS WORD
POWER POINT, MOODLE, EMAIL*

1.2 Why do you use it?

Referencing, report writing, lecture notes, communication

2. Assessing the suitability of the existing University Website

1.3 If you use the current website, what do you use it for? *I DO NOT*

1.4 What do you like about the current website? *NOTHING - BADLY
DESIGNED*

1.4.1 Why do you like the[se] feature[s]?

1.5 What do you dislike about the current website? *POOR DESIGN - INCONSISTENCY
COLOUR CLASHES*

1.5.1 Why do you dislike the[se] feature[s]? *BAD LINKS I DON'T WORK
TOO MUCH TEXT*

2. Gauging the potential of a Campus Companion App

2.1 Is the idea of a companion app something that you would be interested in?

YES

2.2 What features would you like to see in a concentrated companion app? SOFTWARE, COMMUNICATION GROUP CHAT, EMAIL, MOODLE, LIBRARY

2.2.1 Why do you want to see the[se] feature[s]?

COMMON ASPECTS OF STUDENT LIFE

2.2.2 What is the one most important feature from this list?

SOFTWARE DOWNLOAD UNITS

2.3 When using such an app, what features would you not want to see?

NO IDEA

2.3.1 Why do you want to see the[se] feature[s]?

2.4 Is there anything outside of these questions that you would like to add?

NO

- ii. Follow up requirements gathering a using revised requirements sheet

Student University Companion App – Requirements Brainstorm Sheet

Name(s): Ted R. Hill

- Course(s): BEng Computer Systems & Electronics
- Age(s): 22
- Year(s) of study: 3

Time: 10:53

1. Understanding current software usage

1.1. What software and/or sites do you currently use for your studies? Please list all that apply
Rebels, Echo-PC, CCS, Libraryladder, Moodle, Office.

1.2. Why do you use it/these programs and/or sites?

They are required to complete projects & assignments. They are pieces of software available on most Uni PCs.

2. Assessing the suitability of the existing University Website

2.1. If you do use the current website, what for?

Nothing

2.2. What do you like about the current website?

It's a nice shade of blue

2.3. Why do you like the feature(s) you have listed?

N/A

2.4. What do you dislike about the current website?

No purpose to be it, bit dull

2.5. Why do you dislike the feature(s) you have listed?

Front page is very cluttered

3. Gauging the potential need and contents of a Campus Companion App

3.1. Is the idea of a companion app something that you would be interested in?

Nope

3.2. What features would you like to see in a concentrated companion app?

Easy Access to library, Moodle, etc without being sent to a browser.

3.3. Why would you want to see these feature(s) in the app?

Streamline the process of accessing pages/features.

3.4. What is the one most important feature for you from this list of features?

Access to library

3.5. When using such an app, what features would you not want to see?

Web links, news.

3.6. Why might you not want to see these feature(s) in an app?

websites depend the purpose of an app. The news is already everywhere else. I want really good.

4. Is there anything outside of these questions that you would like to add or comments you might make on the proposed system?

Student University Companion App – Requirements Brainstorm Sheet

Name(s): Simon Downes
Course(s): MPhil APPLIED COMPUTING.
Age(s): 43
Year(s) of study: 2ND

Time: 10.53

1. Understanding current software usage

- 1.1. What software and/or sites do you currently use for your studies? Please list all that apply
MENDELEY, NETACAD(CISCO), MS OFFICE, MATLAB, MOODLE, PACKET TRACER, NETSIM, GOOGLE, IEEE XPLORE, ONEDRIVE
1.2. Why do you use it/these programs and/or sites?
RESEARCH, STUDIES, ASSIGNMENTS.

2. Assessing the suitability of the existing University Website

- 2.1. If you do use the current website, what for?
QUICK LINKS.
2.2. What do you like about the current website?
NOT MUCH AS I USE THE QUICK LINKS TO NAVIGATE FOR WHAT I NEED.
2.3. Why do you like the feature(s) you have listed?
IT GETS ME TO MOODLE, EMAIL + LIBRARY RESOURCES.
2.4. What do you dislike about the current website?
ITS SCROLL OF DEATH, BANNER TOO LARGE. OLD FASHIONED
2.5. Why do you dislike the feature(s) you have listed?
THE BANNER TAKES OVER THE PAGE SO SCROLLING IS THE ONLY WAY OF NAVIGATION.

3. Gauging the potential need and contents of a Campus Companion App

- 3.1. Is the idea of a companion app something that you would be interested in?
YES.

3.2. What features would you like to see in a concentrated companion app?

EMAIL, MOODLE, ACCESS TO LIBRARY RESOURCES,
STUDENT SERVICES + STUDENTS UNION, TIMETABLE.

3.3. Why would you want to see these feature(s) in the app?

THEY ARE THE MOST COMMONLY USED.

3.4. What is the one most important feature for you from this list of features?

MOODLE.

3.5. When using such an app, what features would you not want to see?

LINKS TO OTHER SITES, ADVERTS.

3.6. Why might you not want to see these feature(s) in an app?

TOO MUCH CLUTTER.

4. Is there anything outside of these questions that you would like to add or comments you might make on the proposed system?

AS WITH MYDAY THE USABILITY WILL
BE A MAJOR FACTOR, KEEP IT SIMPLE
AND NOT CLUTTERED. MAYBE AN OPTION
TO SELECT AND PERSONALISE CONTENT.

C) Testing Sheets

Student University Companion App – Usability Testing Itinerary

1. Understanding the Usability Testing Participant

1.1. Name: Johnathan Davies.

1.2. Age: 26

1.3. Course of Study: 2nd

1.4. Time: 09:11

2. Outlining the Test/Evaluation Process

2.1. Outline reasons for testing and what the test will involve

Companion - evaluating first designs

2.2. I am not here to influence you and your response to any questions that I ask

2.3. There are no right or wrong answers. I am testing the system we [the development team] have designed, and not you.

2.4. There are no right or wrong answers to any of the tests that follow

Fine.

2.5. Do you have any questions about this test?

John had no questions beforehand.

3. Test 1: "You have been into the library and have found a book you would like to take out, you now want to reserve it in the app rather than use the library machines".

3.1. Test Processes, Outcomes and Interaction Comments

- ① Signs in fine using his details → homepage/dashboard.
- ② Goes to "My Library" because of academic sources line on this button.

- ③ Opens library 'main menu', looks down list and knowing he wants to request a book very quickly selects 'Quick Request'.
- ④ Arrives at page where book can be requested.

3.2. Was the text:

3.2.1. Size suitable?

Yes, he thought quick + easy to read made it suitable.

3.2.2. Neatly and clearly positioned?

Yes, not sure about hand icon on 'Quick Request' button.

3.2.3. Was the terminology used familiar?

Felt it was consistent with main uni site and was well chosen.

3.3. Were the buttons suitable?

Large, easy to see and hard to miss. No

3.4. Did anything not work spatially?

Troubles here. Not really - possibly consider aligning second

3.5. Any other comments?

menu buttons and icons better. Felt this task was easy to complete with app.

4. Test 2: "View Student Union events happening on the Swansea campus,

but get distracted and instead must quickly forward an urgent email you receive."

* told to go to email when at TSDSU main page *

4.1. Test Processes, Outcomes and Interaction Comments

- ① Started back at homepage.
- ② Went v. quickly to TSDSU page as recognises that events should be under here.
- ③ To go to Email ~~Does Not Go Back~~ searching instead

4.2. Was the text:

4.2.1. Size suitable?

Yes, fine

4.2.2. Neatly and clearly positioned?

Comments as previous test.

4.2.3. Was the terminology used familiar?

Yes, as above.

Which returned 'Outlook' as a top result. Clicked here to open email,

4.3. Were the buttons suitable?

Yes, large + clear. John said they were

4.4. Did anything not work spatially?

'predictable'.

Could consider button icons again for TSBSU

4.5. Any other comments? menu.

None, completed task successfully.

5. Test 3: "View your timetable to see if any lecturers on today have been postponed".

5.1. Test Processes, Outcomes and Interaction Comments

- ① Back at Homepage. Wanted to find a timetable in app and could clearly identify 'My Timetable'!
- ② Was looking for a second menu as per TSBSU that

5.2. Was the text:

would open calendar view.

would also want to see the module notices. But happy with click path!

5.2.1. Size suitable?

Yes

5.2.2. Neatly and clearly positioned?

Yes

5.2.3. Was the terminology used familiar?

Fine, good idea to bring Moodle notices

5.3. Were the buttons suitable?

from Moodle to here.

Yes, clearly showing how to get to timetable.

5.4. Did anything not work spatially?

Comments as previous tests.

5.5. Any other comments?

None ~~except~~ except moodle notices concept.

6. Test 4: "Save your login details so that you do not have to repeatedly sign in and close the app, then decide to instead use the secure Touch ID as authentication instead".

- ① John wants to get to Settings in app as he knows where option will be contained.
- ② Can see a button at the bottom of page and wants to try here.

③ Control on/off iOS clearly marked to remember current login.

④. Pressed back fine

6.1. Test Processes, Outcomes and Interaction Comments

⑤. At home went back into options.

⑥. Checked on/off iOS control for Touch ID, no issues.

6.2. Was the text:

6.2.1. Size suitable?

Yes, nice size.

6.2.2. Neatly and clearly positioned?

Yes, very clear

6.2.3. Was the terminology used familiar?

Yes, could also use 'settings' as well as options.

6.3. Were the buttons suitable?

Yes, clear and obvious.

6.4. Did anything not work spatially?

Everything nicely positioned.

6.5. Any other comments?

None, completed navigation test quickly.

7. Test 4: "Check to see if a lecturer has uploaded a file to the Database

Management Systems module that you have requested them to add".

7.1. Test Processes, Outcomes and Interaction Comments

① Identified quickly Moodle as an application. Also process of elimination.

② From 'My Programs' clicked straight away on Moodle.

7.2. Was the text:

③. Clicked straightforwardly on DBMS module.

④. Clicked to expand correct banner.

7.2.1. Size suitable?

Yes

7.2.2. Neatly and clearly positioned?

Yes

7.2.3. Was the terminology used familiar?

Yes, v. easy to follow.

7.3. Were the buttons suitable?

Yes. Could consider module dropdowns as a new page to reduce scroll.

7.4. Did anything not work spatially?

All straightforward, no concerns.

7.5. Any other comments?

Fine.

8. Across all the tasks at any point did you feel you didn't understand or was not raised in any of the test scenarios that you experienced while using the app?

No. All perfectly understood.

9. Having looked and explored a prototype companion app are there any additional features you feel would also be useful?

None identified.

Thank you for participating. End of Test. ✓

Student University Companion App – Usability Testing Itinerary

1. Understanding the Usability Testing Participant

- 1.1. Name: Peter Davies
- 1.2. Age: 32
- 1.3. Course of Study: BSc Web Development.
- 1.4. Time: 10:40.

2. Outlining the Test/Evaluation Process

- 2.1. Outline reasons for testing and what the test will involve
- 2.2. I am not here to influence you and your response to any questions that I ask
- 2.3. There are no right or wrong answers. I am testing the system we [the development team] have designed, and not you.
- 2.4. There are no right or wrong answers to any of the tests that follow
- 2.5. Do you have any questions about this test?

No questions

3. Test 1: "You have been into the library and have found a book you would like to take out, you now want to reserve it in the app rather than use the library machines".

3.1. Test Processes, Outcomes and Interaction Comments

- ① Sign in first.
- ② My library
- ③. ~~Wanted to go~~ Peter^ to Saved Searches instead of quick reserve, assumed book already saved.

④ Wanted to keep using 'Back' to go home.

Was looking for 'Home' instead, but didn't see one on page.

3.2. Was the text:

3.2.1. Size suitable?

Size good

3.2.2. Neatly and clearly positioned?

Yep fine, nice and clear.

3.2.3. Was the terminology used familiar?

Yep, Database by Subject could change.

3.3. Were the buttons suitable?

Process of elimination.

Yep, said they were fine.

3.4. Did anything not work spatially?

Fine, no issues.

3.5. Any other comments?

None, no other comments.

4. Test 2: "View Student Union events happening on the Swansea campus, but get distracted and instead must quickly forward an urgent email you receive."

4.1. Test Processes, Outcomes and Interaction Comments

① Goes to TSPSU.

② Events for this menu.

③ Click on notification bar, or go back, then

4.2. Was the text:

In 'Programs' and then Outlook.

several times
from this menu.

4.2.1. Size suitable?

Fine

4.2.2. Neatly and clearly positioned?

Yep good.

4.2.3. Was the terminology used familiar?

Outlook could become Email

4.3. Were the buttons suitable?

Yes

4.4. Did anything not work spatially?

No, was fine.

4.5. Any other comments?

Apart from little terminology.

5. Test 3: "View your timetable to see if any lecturers on today have been postponed".

5.1. Test Processes, Outcomes and Interaction Comments

- ① Timetable from Homepage,
- ② Timetable from Second menu list.

5.2. Was the text:

5.2.1. Size suitable?

Fine, no issues

5.2.2. Neatly and clearly positioned?

Fine, yes good

5.2.3. Was the terminology used familiar?

Clear for this task

5.3. Were the buttons suitable?

Yes, clear and obvious.

5.4. Did anything not work spatially?

No, all was fine.

5.5. Any other comments?

No, easy path.

6. Test 4: "Save your login details so that you do not have to repeatedly sign in and close the app, then decide to instead use the secure Touch ID as authentication instead".

- ① Struggled. Wanted to save details, ~~but~~. When signing in to app - didn't see 'options' as what he wanted.
- ② Eventually, wanted to try options but did not like this design decision. Caused confusion.

6.1. Test Processes, Outcomes and Interaction Comments

- ③ Did eventually understand how to complete the interaction/task set.

6.2. Was the text:

6.2.1. Size suitable?

Yes

6.2.2. Neatly and clearly positioned?

Positing and arrangement caused confusion.

6.2.3. Was the terminology used familiar?

Yes.

6.3. Were the buttons suitable?

Yes, but purpose unsure or goals were unclear,

6.4. Did anything not work spatially?

All fine

6.5. Any other comments?

Why not option to save when signing in?

7. Test 4: "Check to see if a lecturer has uploaded a file to the Database

Management Systems module that you have requested them to add".

7.1. Test Processes, Outcomes and Interaction Comments

- ① Straight to "My Programs and Apps" at main menu.

- ② Clicked on Moodle in "My Programs" Menu, then

7.2. Was the text: selected correct module,

- ③ Would then use dropdowns for weekly content.

7.2.1. Size suitable?

Yes

7.2.2. Neatly and clearly positioned?

Yes

7.2.3. Was the terminology used familiar?

Very familiar

7.3. Were the buttons suitable?

Perfectly clear

7.4. Did anything not work spatially?

No, very consistent.

7.5. Any other comments?

Task clearly and quickly fulfilled.

8. Across all the tasks at any point did you feel you didn't understand or was not raised in any of the test scenarios that you experienced while using the app?

No additional comments.

9. Having looked and explored a prototype companion app are there any additional features you feel would also be useful?

No, this is OK, all options really considered.

Thank you for participating. End of Test.

Student University Companion App – Usability Testing Itinerary

1. Understanding the Usability Testing Participant

1.1. Name: *Ruth Melton*

1.2. Age: *21*

1.3. Course of Study: *BSc Architecture. (3rd yr).*

1.4. Time: *11:55.*

2. Outlining the Test/Evaluation Process

2.1. Outline reasons for testing and what the test will involve

2.2. I am not here to influence you and your response to any questions that I ask

2.3. There are no right or wrong answers. I am testing the system we [the development team] have designed, and not you.

2.4. There are no right or wrong answers to any of the tests that follow

2.5. Do you have any questions about this test?

No questions were asked.

3. Test 1: "You have been into the library and have found a book you would like to take out, you now want to reserve it in the app rather than use the library machines".

3.1. Test Processes, Outcomes and Interaction Comments

- ① She recognises activity as a library process, clicks on library menu item
- ② Tries to go to library to find book to request - rather than go to 'Quick Reserve'.

- ③ Realises this is wrong, goes back. Says she would then go to try 'Quick Reserve' but unsure
- ④ Page opened

3.2. Was the text:

3.2.1. Size suitable?

Yes, size was not the issue.

3.2.2. Neatly and clearly positioned?

It was neat + well arranged.

3.2.3. Was the terminology used familiar?

Yes, no issues here.

3.3. Were the buttons suitable?

No, wording unclear + processes were confusing.

3.4. Did anything not work spatially?

no issues.

3.5. Any other comments?

Do I save a book first? Why Quick request item?

4. Test 2: "View Student Union events happening on the Swansea campus,

but get distracted and instead must quickly forward an urgent email you receive."

↑
little unsure of purpose?

4.1. Test Processes, Outcomes and Interaction Comments

- ① As SU event Roth wants to go to SU page from the main menu list items.
- ② Clicks on 'Events' on this page to view content.

4.2. Was the text:

- ③ Uses 'Back' buttons to return to homepage. DID NOT USE SEARCH - said she didn't think to use an option like this.

4.2.1. Size suitable?

Yes

4.2.2. Neatly and clearly positioned?

Yes

4.2.3. Was the terminology used familiar?

Yes, no misunderstanding.

4.3. Were the buttons suitable?

Yes, she could clearly forward and backward navigation controls.

4.4. Did anything not work spatially?

No, nothing placed incorrectly or poorly

4.5. Any other comments?

No. Did say she might not see 'search' control.

5. Test 3: "View your timetable to see if any lectures on today have been postponed".

① Wanted to clearly go to timetable and press button.

5.1. Test Processes, Outcomes and Interaction Comments

② Despite not added wanted to go via 'timetable' on a secondary menu to View Schedule

③ Could navigate back to ~~main~~ main menu no problem

5.2. Was the text:

5.2.1. Size suitable?

Yes, no concern.

5.2.2. Neatly and clearly positioned?

Yes, said she wanted to see an actual

5.2.3. Was the terminology used familiar? Calendar view.

Yes, clearly up until calendar view.

5.3. Were the buttons suitable? No confusion here

Yes, unmissable.

5.4. Did anything not work spatially?

No, made sense on screen.

5.5. Any other comments?

Task easily completed.

6. Test 4: "Save your login details so that you do not have to repeatedly sign in and close the app, then decide to instead use the secure Touch ID as authentication instead".

① Took a second on homepage to try the options menu.

② Did enquire about any choice on sign in page.

- ③ Used back to get back to main menu
 ④ repeated process to go back and alter a setting option for touch 110.

6.1. Test Processes, Outcomes and Interaction Comments

task was completed, despite no visible control on options page.

6.2. Was the text:

6.2.1. Size suitable?

Yes

6.2.2. Neatly and clearly positioned?

Yes, nice idea she said to have

6.2.3. Was the terminology used familiar? everywhere.

Clearly understood labelling - options

6.3. Were the buttons suitable?

Yes, she liked.

6.4. Did anything not work spatially?

No concerns with this.

6.5. Any other comments?

None. Completed and clearly understood.

7. Test 4: "Check to see if a lecturer has uploaded a file to the Database

Management Systems module that you have requested them to add".

- ① Quickly identified the menu item from main menu.

7.1. Test Processes, Outcomes and Interaction Comments

- ② Really liked secondary labelling and clicked Module from Secondary "My Programs Menu."

- ③ Identified module from available button list.

7.2. Was the text:

- ④ took a second to comprehend dropdown - she said because one item was open?

7.2.1. Size suitable?

Yes, no issues.

7.2.2. Neatly and clearly positioned?

Yes especially with second-line buttons.

7.2.3. Was the terminology used familiar?

liked second-line labels a lot to show where stuff is.

7.3. Were the buttons suitable?

Yes, took second to see as dropdown in mobile module.

7.4. Did anything not work spatially?

No, made sense

7.5. Any other comments?

Said progression here was as she would expect.

8. Across all the tasks at any point did you feel you didn't understand or was not raised in any of the test scenarios that you experienced while using the app?

Yes, what is difference between journal and library database → unsure and she said would try both or/and press wrong one when finding sources.

9. Having looked and explored a prototype companion app are there any additional features you feel would also be useful?

↓
wording/
label issue.

Thank you for participating. End of Test. ✓